

Buyer's Guide to
PORTABLES

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JULY 1984

VOLUME 2
NUMBER 7

FAMILY COMPUTING

\$2.50

Celebrate! Let Your Computer Plan the Party

Software for
Making Music

10 Ways Your
Computer Can
Earn Its Keep

INSIDE

Original Programs
for ADAM, Apple,
Atari, Commodore 64
& VIC-20, IBM,
TI, Timex and
TRS-80





How to talk your parents

There's a new Apple® Personal Computer called the IIc that's so complete and so affordable that getting your parents to buy one should be easier than learning Logo.

If, that is, you know what to say.

For example, don't tell your parents that the IIc has the first true 128K VLSI motherboard, dual built-in RS-232 ports and a built-in half high disk drive. Or that it has a switchable 80/40 character display and built-in mousetronics so it can use an AppleMouse.

You know that's incredible in an 8 pound* computer, but all those specs

may make your parents uncomfortable.

Just tell them that the Apple IIc can run more than 10,000 programs written for the Apple IIe, the most popular computer in education at all levels. And it

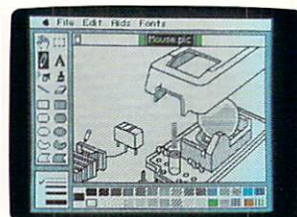
You might also mention that it's a bargain. It comes with everything you need to start computing in one box—including an RF modulator that lets you hook it up to your TV the moment you



The IIc shows off its true colors with SubLogic's Flight Simulator II.



AppleWorks—advanced business software even a parent could love.



With MousePaint, you could become the next Picasso. Or the next Charles Schulz.

works just the same as the Apple computers you learn on in school.

get it home. There's even a free 4-diskette course on computer basics they



into parting with \$1300.

can use when you're too busy to show them how.

All for under \$1,300**

Of course, they probably won't want to hear that it runs more games than any other computer in the world except the Apple IIe.

But they might like to know that it also runs advanced business software. Including specialized programs for every profession from doctoring to farming to astronauting. Not to mention personal productivity software to manage their

personal finances and taxes.

Speaking of which, they can deduct part of an Apple IIc's price from their taxes if they use it for business.

Even if they always keep it at home.

Don't confuse them right now with the wide array of Apple IIc accessories and peripherals. Like Apple's 1200/300

modems. Or the IIc's low cost full-color graphics/text printer, Scribe.

But assure them that your IIc can grow just as fast as you do.

Now, if all of these carefully reasoned arguments fall on deaf parental ears, don't despair.

There is still

one thing more you can do.

Get a paper route.



*The IIc alone weighs just 7.5 pounds. Power packs, monitors, printers, modems and mice can make it as heavy as you'd like. **Suggested retail price. © 1984 Apple Computer, Inc. Apple and the Apple logo are trademarks of Apple Computer, Inc. For an authorized Apple dealer nearest you, call (800) 538-9696. In Canada, call (800) 268-7796 or (800) 268-7637.

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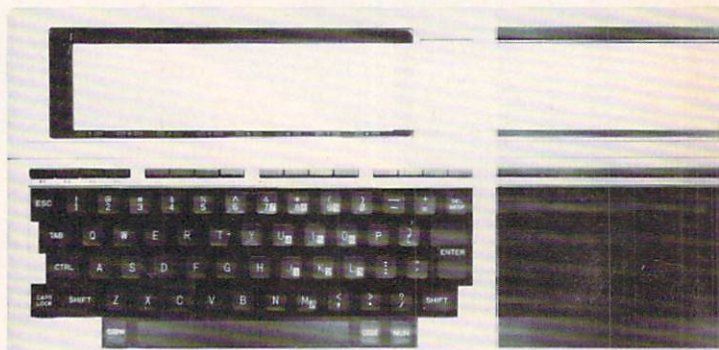
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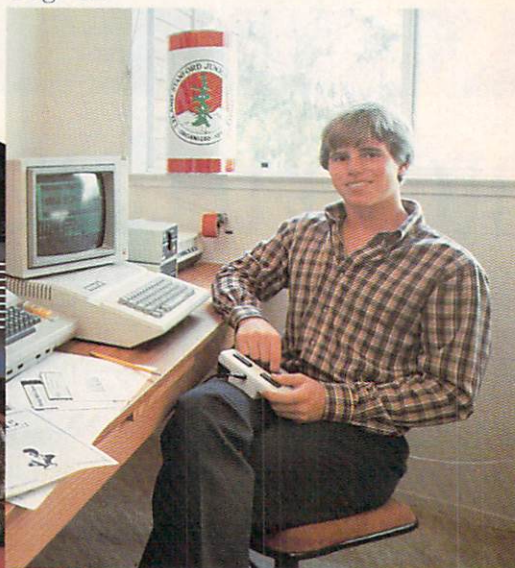


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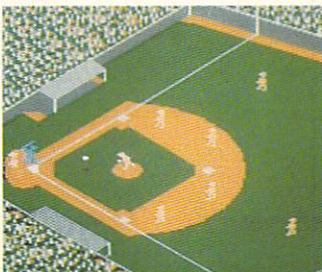
Sorry, we goofed. Inside, we've provided a few corrections for programs from previous issues.

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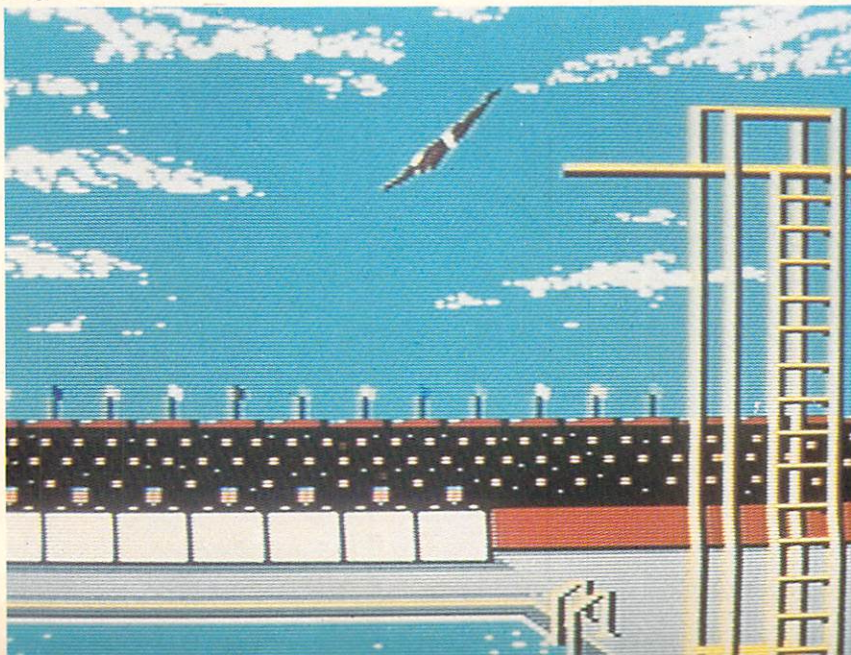
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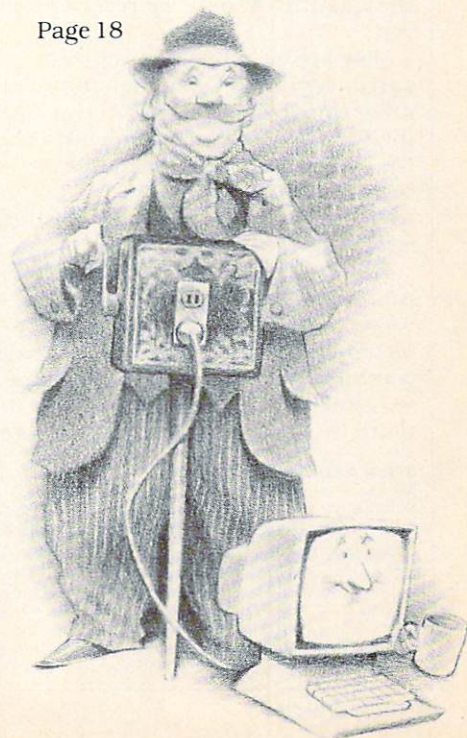
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EDITOR'S NOTE

FAMILIES AND COMPUTERS

It's hard to be totally sure of a new idea, especially when detractors attack it. So I held my breath a little last year when I read a statement from a major computer magazine publisher asserting that computing would never be a family pursuit.

We, on the other hand, started FAMILY COMPUTING in response to the need we saw among families with school-age children who were trying to work computers into their lives. We felt that with more than 60 years of experience creating books and magazines that help young people master complex subjects, Scholastic Inc. could bring FAMILY COMPUTING to life with great effectiveness.

Now, our concept and its execution have undergone the test of almost a year's time and the scrutiny of extensive research. The results are gratifying.

Most important is the test with you, our readers. We can measure your reaction to our performance through a combination of response mechanisms: the number of copies we sell—both on the newsstand and through subscriptions, the number of subscribers who renew, the number of readers who send in the subscription cards in each issue, and the quantity of mail we receive from you.

How are we doing? By all measures, very well! Our circulation has grown much faster than we ever imagined—to 375,000 starting with this, the July issue. And our mail from readers keeps pouring in. (So far we're able to print only a few of the letters we receive each month.)

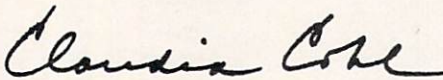
But the real story lies behind the numbers in the research studies we've undertaken. We recently completed the largest reader survey ever conducted by a computer magazine. We mailed an extensive questionnaire to 3,000 of our readers and re-

ceived responses from well over 60 percent. (In subsequent issues, I'll tell you about some of the more interesting findings.)

We've tested many of the theories people involved with computers have been spouting about their use, and we can now support a lot of the theories with hard evidence. Central to it all is the question, Is there such a thing as "family computing"? The answer is clear. In the households surveyed, there is an average of 2.73 computer users. To break that down further, we found that more than 70 percent of the fathers use the computer, over 55 percent of the mothers, and just about 65 percent of the children.

That means "family computing" is a reality. Of course, among these people there are individuals using the computer for a unique purpose. But we also know that there are thousands of households in which family members are more closely united than ever because of their mutual interest in and shared use of the computer. This is certainly corroborated by the mail we receive.

We'll continue to bring you more of the statistical information about our computer users, and we hope you'll continue to supply us with the substance behind the figures—the stories about your personal experiences that make up the heart of FAMILY COMPUTING. The numbers are nice to have, but I'll put my money on people any time. That was the whole idea in the first place! Computing is definitely a family pursuit!



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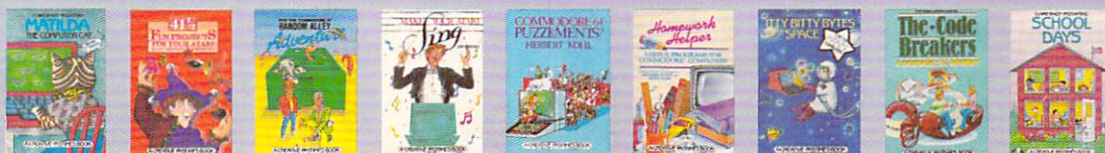
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 While turning work into play.
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LETTERS

FAN-FARE

My friend Raymond Kim and I own Apple IIe computers. We each have a subscription to your magazine and are avid readers. We love your articles and memorize each page. We enjoy your programs and What's In Store articles. Your Software Guide is very informative and we stand by it in purchasing new software. We will continue to read your understandable magazine and will definitely renew our subscriptions.

JOSEPH RUSSO, 12
RAYMOND KIM, 12
Colonia, New Jersey

SEEKING SAT SOFTWARE

Thank you for your article "The TI-99/4A Lives" (*Behind the Screens*, April 1984). I own a TI and would like to know if any software companies are planning to make a program for the Scholastic Aptitude Test (SAT) in the near future.

RICHARD BENNET
Southgate, Michigan

EDITOR'S NOTE: We know of no SAT programs currently available for the TI. However, there are other word-skill programs for the TI that can help you prepare. Watch for our article about SAT software in the upcoming September issue.

A SPECIAL VALENTINE

Please consider this letter one of your "Valentines" from a family of appreciative readers!

Your programs are terrific—short enough for children or hurried homemakers to still have time to use and enjoy. Thanks also for the excellent articles in Home-School Connection. As an enthusiastic parent helping with computer labs at the schools of my three sons, these articles will continue to be shared with others in our district.

I also greatly appreciate the Home Business ideas, since using a computer from your home, especially for part-time work, is important to many mothers who don't want to leave smaller children alone or with sitters.

My only suggestion is that you allow more empty space at the center of the program pages. I always cut these programs out and put them in a notebook with other programs I collect.

Your magazine truly does care

about how a family could use, and benefit from, a home computer. A magazine with your viewpoint is needed.

MRS. CAROL FREED
Bend, Oregon

AN INSPIRING IDEA

After I read your article about Users' Groups in the March issue, I suggested the idea to our grade-school principal. He liked the idea. We got it off the ground starting with 32 members. Thank you so much for the article.

JAMES L. KINNAIRD, 12
Randlett, Oklahoma

ROOKIE SEEKS READER AID

I am a new owner of a TRS-80 Color Computer 2 with 16K nonextended BASIC. I also am a producer in a nonautomated insurance agency. I am interested in coming up with a program to rate automobile insurance on my CoCo, and possibly on Radio Shack's Pocket Computer as well. If any of your readers have written such a program I would be happy to hear from them.

Let me also say that I enjoy your fine magazine. You have been a great help to this computer "rookie."

MARK ROSS
Batavia, New York

EDITOR'S NOTE: If any readers have developed such a program, please write to "Rookie" Mark, c/o FAMILY COMPUTING, 730 Broadway, New York, NY 10003.

EXPLORING A NEW ENVIRONMENT

Thank you for being a true guide as my family and I explore the maze of our new environment with computers. It is as if you knew my questions as I discovered them.

Working with my children's school, their Franklin computers, and the Logo language, your February issue on Logo was a much-appreciated aid. Your Winter Programs were great fun. Over the holidays, my children derived great pleasure and satisfaction from typing in programs from previous issues. The programs encourage my children in their learning and enjoyment of their Commodore 64.

My husband and I have used your magazine as a guide to new software. We avidly read the articles on

new products and tables of comparisons. You have aided us in our purchasing choices and have added to our awareness of the new world of consumer merchandise for computer owners.

I am most impressed with the ability of your magazine to cover such a wide variety of topics so well.

MRS. JAMES A. ATHERTON
Bothell, Washington

WANTED: AN EASTER BUNNY

Like so many of your readers, I have devoured each issue from cover to cover. However, one of the first things I do (when the issue arrives) is race to our Apple IIe and type in the graphics program. *Jack-o'-Lantern* and *Christmas Tree* were our favorites. I was very disappointed when the April and May issues had no graphics program. My 4-year-old is still anxiously awaiting the "Easter bunny."

MRS. CHARLES F. STEWART
Santa Paula, California

EDITOR'S NOTE: Sorry we missed the Easter bunny. Check out this month's graphics program—the Liberty Bell.

THANKS FOR TIMEX PROGRAMS

Congratulations on a splendid publication and for including the Timex Sinclair 2068 in your interesting programming section. Hopefully, you will be able to sustain your quality level and will continue to include the 2068 in future issues.

DON MILLIRONS
Oklahoma City, Oklahoma

AN AWESOME COMPLIMENT

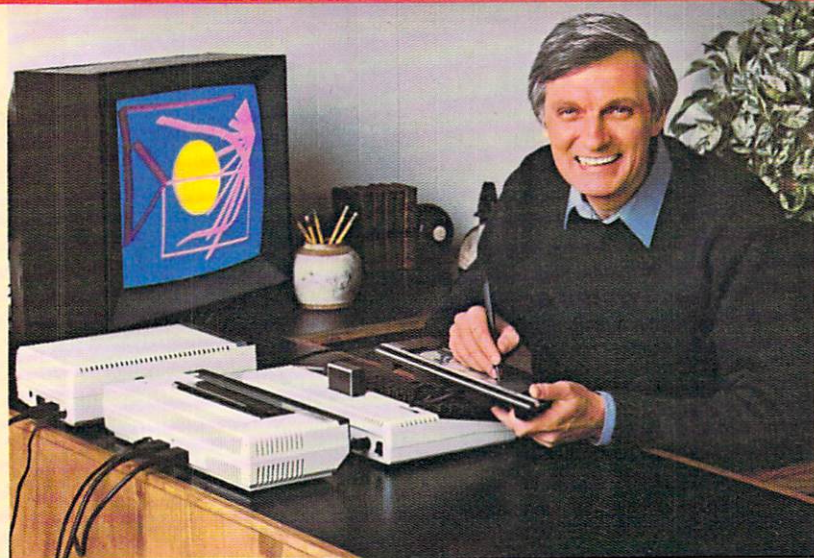
You are AWESOME! I am 12 and have been programming for almost two years on my TRS-80 Model III. I have read or subscribed to about every computer magazine and I think yours is the best by far.

Thanks a heap.

LANCE KELLEY, 12
Falls Church, Virginia

FAMILY COMPUTING looks forward to letters from all our readers. Please direct your correspondence to: Letters to the Editor, FAMILY COMPUTING, 730 Broadway, New York, NY 10003. Include your name, address, and phone number. We reserve the right to edit your letters for length and clarity.

DISCOVER COMPUTERS WITH ATARI.



Atari® presents the
five greatest advances
in the creative arts
since someone put
72 crayons in one box.

What would Cezanne say to an electronic orange? Surely Van Gogh would go for some flowers painted in phosphors (those glowing things in your TV screen). And you bet Beethoven would be blown away by a computer synthesized symphony.

Too bad. They were all born too early. But luckily you weren't. Because Atari makes several home computer products to help you create all these things and more.

First, there's ATARI Paint,* the program that turns the joystick you already own into a computerized paintbrush that helps you explore the fascinating world of computer art.

Get the magic touch with Atari Touch Tablet.

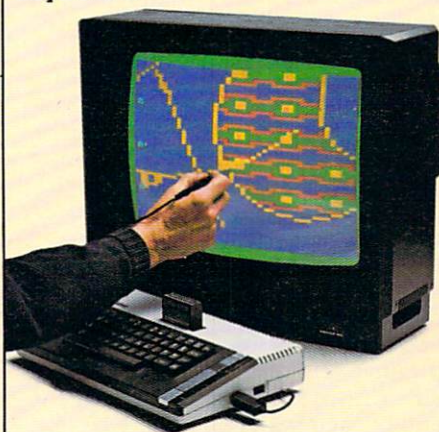


The ATARI Touch Tablet with Atari-Artist™ software cartridge turns your TV into a magic palette of 128 dazzling colors.

The Touch Tablet works a little like an electronic slate. Hook it into any ATARI Computer and what you draw on the tablet will instantly appear on your TV screen. You can draw on the Touch Tablet with the unique electronic stylus that comes with it—or even with your finger.

And all the on-screen commands that control your Touch Tablet are labelled with simple sym-

bols as well as words. So everyone from preschoolers to grandparents can create without going near the keyboard.



Atari Light Pen lets you write right on the screen.

ATARI Light Pen with Atari-Graphics™ software cartridge is among the best tools available for teaching hands-on computer creativity. To draw circles, rectangles, or simply fool around with freehand sketching, just press the pen to your TV screen and VOILA... A trail of sparkling color follows it.

You can fill in your sketches with one or more of 128 colors. Or choose from over 2,800 patterns.

Roll over Beethoven, AtariMusic is here.

Sure, Beethoven took music lessons. But even he didn't get the head start you'll get with AtariMusic™ I or AtariMusic™ II. And once you understand the

basics you'll be ready to move up to ATARI Music Composer® and create original compositions in four part harmony!

All of these programs were designed to get the best from your ATARI Computer, including the ATARI 800XL™ or the less expensive ATARI 600XL™. Both machines give you unsurpassed Atari graphics and four sound channels. And whether you're painting with light or composing at the computer keyboard, you can store your creation on the ATARI 1010™ Program Recorder or the more sophisticated 1050™ Disk Drive.

And if all that doesn't convince you that our new programs are a giant step beyond crayons, consider this: the kids will never write on the wall with a computer.

*SuperBoots™ Software developed by Capital Children's Museum, Washington, D.C., licensed by Reston Publishing Company, Inc. © 1982 Reston Publishing Company, Inc. All Rights Reserved.



**DISCOVER
WHAT YOU AND
ATARI
CAN DO.**

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BEHIND THE SCREENS

PEOPLE, NEWS, AND TRENDS

EDITED BY BILL CAMARDA

The Selling of the Computer, 1984

Most of us like to believe we make our computer and software buying decisions rationally. But do we? Some advertising and marketing experts doubt it.

"People think they're buying computers for rational reasons, but more often than not, they're buying for emotional reasons . . . and rationalizing it later," said Bruce Silverman, executive vice president of the Los Angeles office of the giant advertising agency Batten Barton Durstine Osborn, Inc. (BBD&O).



Apple spent \$1.4 million on this controversial commercial that told consumers, thanks to Macintosh, "1984 won't be like 1984."

Silverman, who spoke at an advertising workshop during the annual *Billboard Computer Software/Video Game Conference* recently, told software manufacturers to make sure their ads reflect the emotional as well as rational needs of computer buyers.

Panelists agreed that computer and software advertising now includes less information about kilobytes, RAM, and ROM, and more about what the product can do for you. The pitch can either be based on applications—word processing, home finance, or games—or it can tell you how good owning the product will make you feel (or how badly you'll feel if you don't buy it).

As advertisers get more sophisticated in presenting their messages to the public, consumers should become more sophisticated as well. Apply the same common-sense rules to the computer marketplace that you would elsewhere: Base your buying decisions on as much information

as possible. Consider value, not just price. Try to become aware of the emotional reasons you may have for choosing a product.

One thing hasn't changed: Smart consumers do better in any marketplace.

—PAM HOROWITZ

Groceries a la Modem

If you're a San Franciscan, you can now do your food shopping from your living room via computer and modem. It's a service of Grocery Express, America's first electronic supermarket.

Grocery Express has been in business since 1981 as a phone-delivery-only supermarket. At the beginning of this year, it began a system to allow customers to shop by computer. The company now has a few dozen regular electronic grocery shoppers.

Computer users are allowed on the system from 7 p.m. until midnight and their orders usually arrive the next morning. Any home or personal computer can be used.

One of the major obstacles to a computerized grocery is the customer's desire to see and handle fresh produce and meats. Grocery Express substitutes a "comment line" at the end of each selection, where customers may specify how large they want their baking potatoes, how ripe they want their bananas, and how thick they want their steaks.



Grocery Express makes a morning delivery.

Spokesperson Gary Pike says the service appeals to very busy people who are willing to trade the tactile pleasure of handling vegetables for the substantial time savings Grocery Express affords. He says they also like having another way to use com-

puters in their day-to-day living.

Customer Bob Platt, a robotics professor, says Grocery Express allows him to "do all my shopping at one time. In twenty minutes I'm done with it." He says that with an added \$2.75 delivery charge, Grocery Express prices are slightly higher than those at conventional supermarkets. But once he takes into account the added expense and hassle of doing his own shopping, he thinks computerized food shopping is saving him money.

Relaxing to Boot?

Stress on the job? In school? At home? Increasingly, psychiatrists and psychologists are reporting incidences of stress in high technology situations. Can the computer play a part in the therapy?

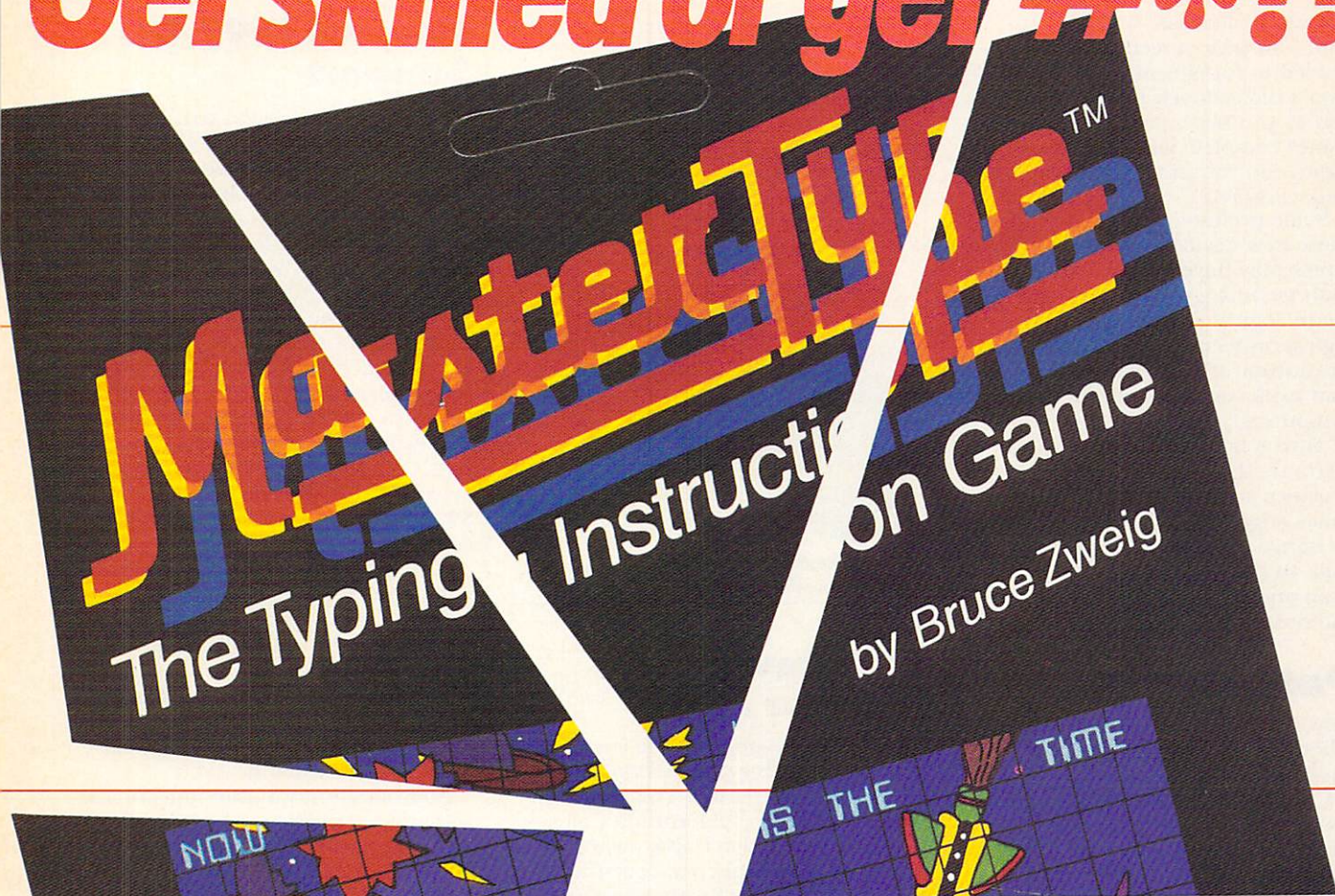


Some software manufacturers think so. One of the latest computer applications is stress control. A number of new and innovative software packages have been designed to reduce stress through biofeedback techniques. One package, *Calmpute* by Thought Technology of Montreal, monitors tension levels by measuring galvanic skin resistance (changes in the electrical resistance of the skin caused by changes in emotional state), and produces a "personal stress profile." It also includes some games which you can only win by staying calm.

Calmpute will be distributed in the United States by HesWare.

Another program, *Relax*, produced by Synapse Software, displays one

Get skilled or get #*?!



Disk:
Apple®
Atari®
Commodore 64®
IBM-PC®
Cartridge:
Atari®
Commodore 64®

The Scarborough System.

© Scarborough Systems, Inc.

25 N. Broadway Tarrytown, New York 10591

BEHIND THE SCREENS

symptom of stress—muscle tension—on your screen. *Relax* is intended to transform your computer into a biofeedback unit that signals you as you become more relaxed. It comes complete with a sensor headband, control unit, relaxation tape, and workbook.

Some professionals are skeptical of these new devices, especially if your stress may have been heightened by high technology itself. "I'm wary of technological solutions to technological problems," says Craig Brod, the author of *Technostress*, a book that explores stress effects caused by computers.

"Stress is not bad," says Brod. "It alerts us that something is wrong. It provides a valuable signal, sometimes suggesting that you may need a change in lifestyle. Sometimes a walk in the park is a better cure than another session with your computer."

—ROBIN RASKIN

Patients' Gazette

How do you make kids feel at home when they're in a hospital? Give them a computer.

Children in the pediatric/adolescent unit at St. Joseph Hospital in Chicago, Illinois, share a Texas Instruments 99/4A computer system on a portable cart. They use it to publish a newspaper in which they share their reactions to the hospital, and let each other know what to expect from the unfamiliar tests and procedures they're undergoing.

Anne, a teenage patient, described her experience: "The IVP was not as bad as I thought it would be. I got dye injected into me because they needed it to see my organs better. The bad thing is that I was not allowed to eat breakfast and had a complete liquid dinner. . . . You may not need an ultrasound, but then again, you might. If you do, then ask them to see your insides. It is neat."

Sandra Elser Ciminero, St. Joseph's Child Life Specialist, says, "The computer is so popular that some patients have said they wanted to stay longer in order to play with it." While most hospital high technology is unfamiliar and frightening, she says the kids are already comfortable with computers.

Most of the children in St. Joseph's use the computer at some point, Ciminero says. Some use it to program in BASIC or Logo; others

play games. Some elementary-school children keep up with their classmates by using the hospital's library of English and arithmetic software.

Lenny, 13, wrote: "This is my first experience in a hospital, except when I was born, of course. . . . I have never thought that while in a hospital I would be writing for a newspaper. How excellent!"



Home computers are making children in one Chicago hospital feel at home.

The Envelope, Please . . .

Billboard Magazine, the leading music industry publication, now covers software, too. The magazine handed out its 2nd annual Computer Software/Video Game awards at a bash in San Francisco recently. Here are this year's software winners:

Best use of graphics and sound: *Flight Simulator II* by subLOGIC. Best packaging, advertising, and in-store promotion by a computer software manufacturer: A tie between Electronic Arts and Infocom. Best home management/personal productivity title: *The Home Accountant* by Continental Software. Best educational title: *MasterType* by Scarborough. Best entertainment title, adventure style: *Zork I* by Infocom. Best entertainment title, arcade-style: *Lode Runner* by Broderbund.



More on TI-99/4A Support

For all of you who've asked, here's an update on support for the Texas Instruments 99/4A home computer:

Membership in the International 99/4 Users' Group, a clearinghouse for 99/4A information, is \$16 a year. For information, write to Box 67, Bethany, OK 73008.

CorComp Inc., the company planning a 99/4A-compatible computer, can be reached by writing to: 23461 Ridge Route Drive, Suite H, Laguna Hills, CA 92653. TI Extended BASIC is now available from Triton Products Co., P.O. Box 8123, San Francisco, CA 94128. The price is \$99.95. Triton also sells other TI software.

The company will be distributing a comprehensive 99/4A hardware and software catalog originally developed by March Direct Marketing. There will be no charge for the catalog.

In April, we reported that Percom Data Corp. of Dallas, Texas, was selling a TI-99/4A disk drive. They have since discontinued it.

Additional information on TI hardware and software sources appeared in *FAMILY COMPUTING*'s June 1984 Computing Clinic. We will, of course, continue to print programs for the 99/4A.

Nibbles

Drill and Practice: School-board members believe that's the best primary use for computers in the schools, according to a recent national survey by the *American School Board Journal* and Virginia Tech. Next came programming. "Introducing new material" finished last. Asked to grade the quality of their own districts' computer instruction, the median response of the 4,000 board members was C+.

Jobhunter's Computer: Subscribers to *The Source*, a national data base, can now get employment advice electronically by using a file compiled by management consultant Albert Henderson. It includes tips, examples, and information on planning a job hunt, writing resumes, answering ads, and interviewing. (Access "A Jobhunter's Computer" by typing PUBLIC 126 at Command Level.)



If getting the whole family together is a real challenge, maybe you need games that really challenge the whole family.

Introducing a new generation of computer games. Family Learning Games from Spinnaker.

Ever notice how a little fun with the family can be a little hard to arrange?

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But what makes our Family Learning Games even more unique is how they help kids learn — about problem solving, strategizing, spelling, even Greek mythology. That's

quite a bit more than they'd learn from a typical board game (if you could even get them to play a typical board game).

So next time you want to get everybody together, don't get discouraged — get Spinnaker's Family Learning Games.

You'll find the biggest challenge in family fun won't be on the refrigerator. It'll be on the computer.

Spinnaker games are available for ColecoVision® and for Coleco Adam,™ Commodore 64™ and Atari® home computers.



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HOME-SCHOOL CONNECTION

A COMPUTER PROGRAM GROWS IN BROOKLYN An Urban School District Looks for Ways to Compute

BY MICHAEL UHL

A year ago, school Superintendent Jerrold Glassman faced a special challenge. He wanted to create a substantive computer-education program for the students of New York City's District 15, an area that embraces much of the old Brooklyn waterfront.

All but one of the district's 25 schools are located in federally designated poverty areas. "We couldn't depend on our kids having computers at home," Dr. Glassman observed. "Still, we wanted to give the kids here as good an education as those who live in more affluent areas." Glassman knew that if the students didn't get involved with computers during the school day, many would never get the opportunity elsewhere.

THE STARTING POINT

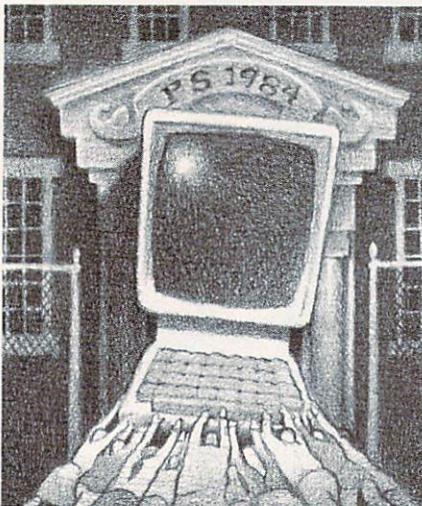
Predictably, the main obstacle to Glassman's plan was a lack of funds. But there were other problems, as well. The district administration had virtually no track record in computer education, and there was an acute scarcity of trained teachers.

Despite the lack of a district-sponsored program, many of the schools had managed to acquire some computer equipment from fundraising efforts of active Parent Teacher Associations over the past three years.

At P.S. 39, a tiny grade school in a 19th-century building that's listed on the National Historic Register, PTA President Elba Haggerty helped coordinate fundraising events, from cake and candy sales to international dinners that reflected the school's diverse ethnic enrollment. The events brought in more than \$10,000, which paid for 10 TRS-80 Model III and 4 computers.

But the fact that computer instruction was going on in some schools and not in others only heightened Glassman's sense of urgency.

His opportunity to take action arrived in the form of the district's annual federal Chapter II money. The



\$120,000 stipend normally is used to replenish library shelves, replace industrial arts supplies, and buy equipment for career-education programs.

Last year, however, Glassman was backed unanimously by the local school board in his decision to spend the entire \$120,000 on computer hardware and software instead.

At the same time, Glassman established a computer advisory committee of interested parents and members of the school board.

Board member Norman Fruchter, an educational consultant who led the "Parent Slate" in the previous school-board elections, wrote to his constituents that even more parent participation was necessary to guide the district's computer decisions.

TAKING STOCK

Before making these decisions or actually distributing any funds to the schools for computer purchases, Glassman first needed to find out exactly what equipment already existed in the schools and how it was being used.

He soon learned that 14 of the 25 schools had some equipment on hand, but that only one school had nearly enough: 20 computers. Moreover, as he had feared, each school had a different approach to computer instruction.

Some schools were stressing programming, and were not exposing their students to packaged software, printers, modems, or disk drives.

At other schools, computers were used only as engines to run drill-and-practice exercises. Glassman felt that these were effective in some remedial situations, but were often being used indiscriminately.

There were even schools where the computer equipment, initially installed with much fanfare, now stood idle. No teachers had been trained to use it.

A POSSIBLE MODEL?

P.S. 321 in Park Slope did offer one well-developed approach to computer education. There, all fourth and fifth graders spend one morning period a week in a room that's set up like an old-fashioned language lab. Instead of facing tape recorders, each "cluster" of two students shares one of 17 Commodore VIC-20 and three Commodore PET computers.

P.S. 321's computer lab is run by teacher Mark Golby, who has written computer books and teaches computing to adults at New York's New School for Social Research. Golby designed a lab curriculum that helps students understand arithmetic concepts while they learn BASIC.

"Young children sometimes have trouble seeing that multiplication is repetitive addition," Golby said. "Take four times three, which is really three plus three plus three plus three. You teach them how to do a program with a counting loop—a FOR . . . NEXT loop where the limit on the loop is four. By doing that, they can see for the first time that by adding over and over again, they're doing multiplication."

SETTING GOALS

According to a "computer concept paper" drafted by Virginia Bartolotti, the district's math coordinator, District 15's first objective would be to create a curriculum, covering kindergarten through ninth grade, that would then make all children computer literate. She defined literacy as "a basic understanding of what a computer is and how it works, what it can and cannot do; the impact of computers on society; the history of

Freelancer MICHAEL UHL of Brooklyn, New York, has written for a number of national magazines.

Sports Illustrated Sports Special

microcomputer news

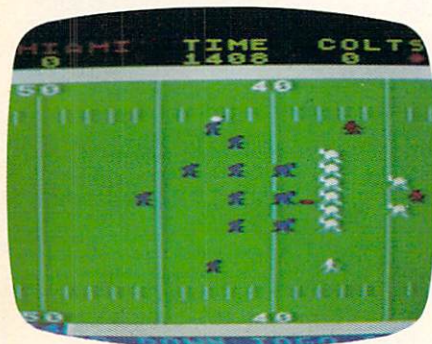
Tuesday, April 1

Four exciting sports games from Avalon Hill

Colts romp over Dolphins, 24-7

Last night's sensational gridiron duel proved there are no underdogs in Avalon Hill's Computer Football Strategy.

The Colts ran in the first Miami punt and then capitalized on a Dolphin fumble to jump out to a quick 14-0 lead.



Early in the 1st qtr. with Colts in possession
ATARI SCREEN

Dropped passes, penalties, fumbles... all took their toll in the exciting contest in the home of Ogie Pincikowski, newest arm-chair quarterback. Says Ogie with some satisfaction, "It's the next best thing to being out on the gridiron itself!"

In Avalon Hill's Computer Football Strategy you pit your skills as play caller against the computer or go head-to-head with a live opponent.

Atari® Home Computers 32K Disk (joystick required); Commodore 64® Disk; IBM® PC 64K Disk; TRS-80® 32K Disk and 32K Cassette for Models I/III/IV; Commodore 64® Cassette & Atari® Home Computers Cassette. All Diskettes \$21; Cassettes \$16.

This "Match from the Past", as the bout has been dubbed, is slated to begin at 9pm in the basement of Marvin "Max" Maxwell's house on the outskirts of Baltimore. States Max, "I've always wondered if the incredible boxing skills of Ali could stand up to the sledgehammer fists of the Brockton Blockbuster."

Avalon Hill's Computer Titlebout will factor in dozens of variables in deciding the ultimate winner, round by grueling round.

Adds Max, "The game gives you the statistics of hundreds of contenders, and lets you do the pairing up. In fact, you can even create your own fighter. Computer Title Bout is a fast-moving game for two players, or solitaire against yourself."

Atari Home Computers 48K Disk for \$30.

Tournament Golf a hole-in-one

"Sixteen feet to the hole and a steep break to the left." Harvey Hornbuster carefully considered his predicament. The entire match had come down to this last putt. Sink it and he's a hero; miss it and he'll be buying the drinks.



Hornbuster teeing off on second hole

Carefully, with a steady hand and just the right twist to the wrists, Harvey took his putt. Looking over his shoulders at the video screen, the other members of his foursome held their breath and stared as the ball steadily approached the hole and then disappeared. A perfect putt!!

Tournament Golf brings you all the tense excitement of a real day out on the links right in your own home. Hooks, slices, muffs, traps, water hazards and rough... it's all there and more, including two challenging 18 hole championship golf courses.

Apple Home computers 48K Disk for \$30. Joystick/Paddles required.

Upstart Cubs Take AH Series in 6

Chicago's stunning victory yesterday in the living room of Computer Statis Pro Baseball's AH-League manager Milton Mousehouse didn't surprise the team's owner, Fred Smith. Commented Smith after the victory, "It was just sound management. My lineup selection, pitcher choices and timely substitutions carried me through."

Trailing 4 to 1 going into the ninth inning, the Cubs' bats finally came alive as they pounded in 5 runs to win the game, and the championship, 6 to 4. A good showing for Fred's cubs, especially after dropping the first two games to the defending champions, the Baltimore Orioles.

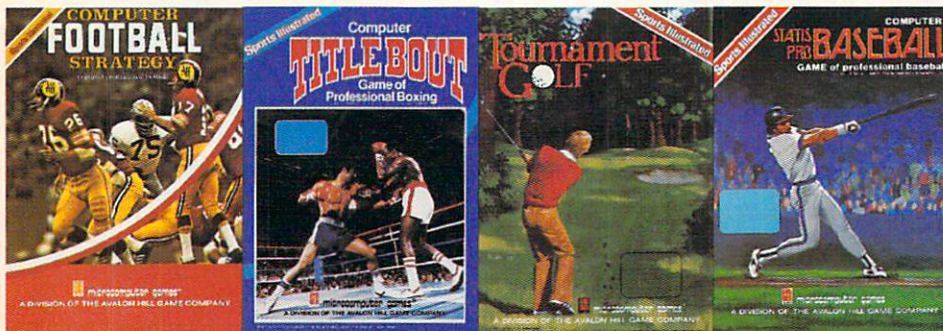
Added Milton, "Avalon Hill's Computer Statis Pro Baseball places you in charge of your favorite ballclub. Your decisions can make an also-ran into a pennant winner. You don't play against the computer. You can, however, play against yourself and have the computer do all the bookkeeping. It will even supply you with a printout of the box-scores after each game, if you have a printer."

Of course, you can also do as Milton and his friends did and organize a league of your own, capping it off with your own championship series. Computer Statis Pro Baseball puts you in the dugout, so to speak, especially with Milton's wife Mortina supplying the hot dogs!

Apple Home Computers 48K Disk for \$35; TRS-80 Mods. I/III/IV: 16K Cassette \$25 & 32K Disk \$35.

Marciano to spar Ali

Tomorrow night's 15 round Computer Title Bout matchup between two of professional boxing's greatest fighters promises to be historic in all senses of the word.



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Dr. Logo™ Language from Digital Research®. It's the perfect guide for children of the computer age. Or grownups who find themselves in the middle of the computer age.

Family Computing says the Logo language is so easy to grasp, many beginners can learn it in an hour.

And the reason is simple. Dr. Logo is a graphics language. So Dr. Logo programming is literally an extension of what people do naturally, doodle.

The computer keyboard works like a pencil, the monitor like a sketchpad. With the help of a friendly turtle that traces commands on the screen, you see visual results instantly. So Dr. Logo turns problem solving and learning basic logic into an exciting video game. To help you along, we include an entertaining



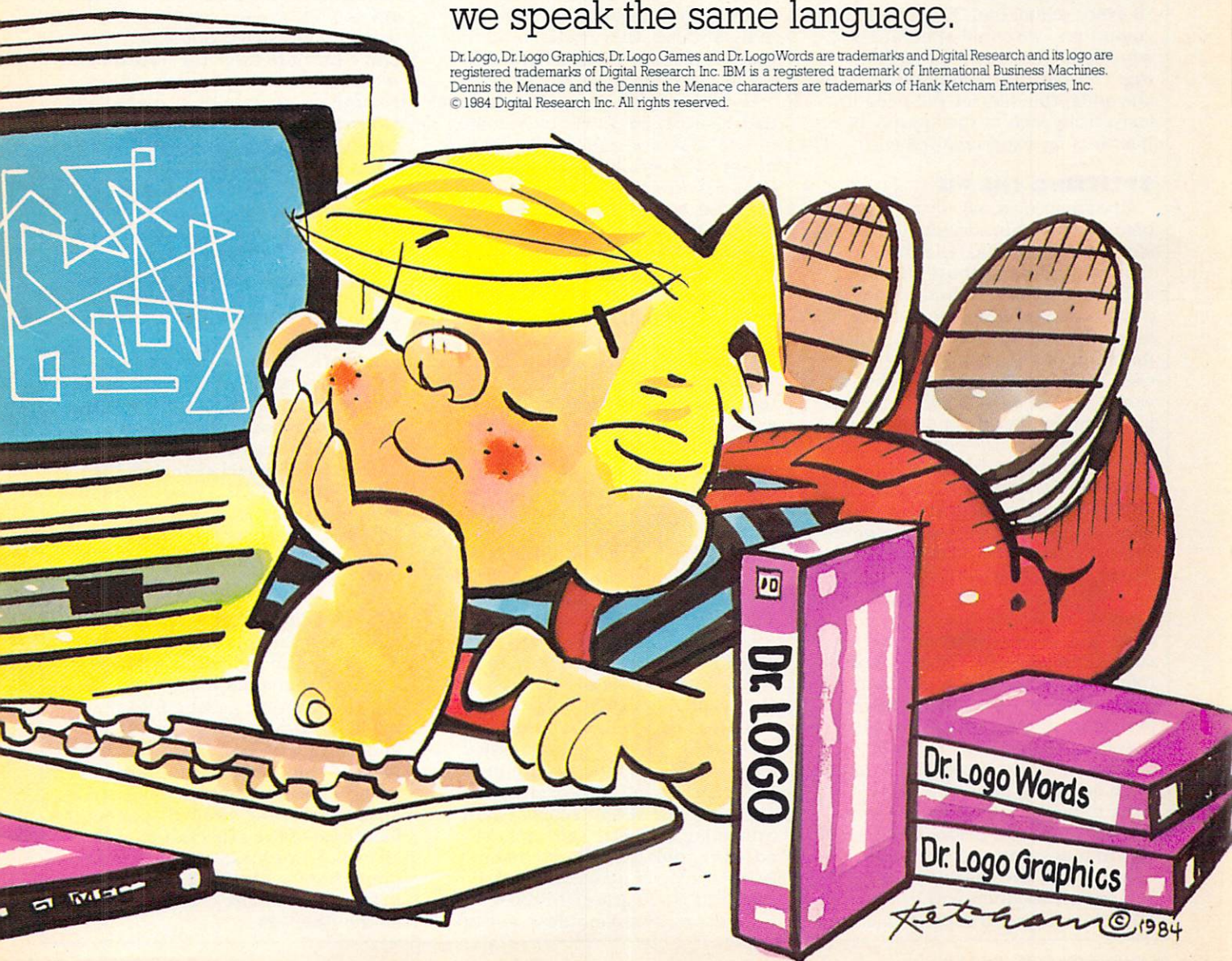
how-to book called, "Dennis the Menace™ Meets Dr. Logo," plus a Dr. Logo dictionary. Both illustrated by award-winning cartoonist, Hank Ketcham.

We also offer three challenging learning pacs as part of a growing Dr. Logo library. Dr. Logo Graphics™ and Dr. Logo Games™ unlock the magic of turtle graphics. Dr. Logo Words™ uses words and symbols to create sentences, bar graphs, even poetry.

For more information about Dr. Logo, future Logo learning pacs or the Digital Research retailer nearest you, call 800-227-1617, ext. 400. In California, 800-772-3545, ext. 400. We think you'll find we speak the same language.

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HOME-SCHOOL CONNECTION

computers; how to care for them, load and save information and operate peripherals; a familiarity with the keyboard and the terminology; and, the ability to identify possible applications for the computer."

Once students had a grounding of computer literacy, the schools would seek to teach programming as a way to learn logical thinking and problem-solving techniques. Finally, students would be prepared for real-world computer use through exposure to software such as word processing and data bases.

Bartolotti said the 25 school principals liked the concept paper, but agreed that careful planning would be needed to put it into effect.

Bartolotti says she doesn't expect the schools to be able to apply these guidelines fully in the near future. "We're not in a position to mandate anything right now," she cautions. "If every school had 30-some-odd computers, we could standardize what we'd like to see the kids doing." To achieve its long-range goals, she adds, the district will need to learn from each of the approaches it has thus far experimented with.

SPLITTING THE PIE

Glassman next asked the school board to help him decide how to allocate the \$120,000. His three options were: to distribute the money at his discretion, to do it on a per-pupil basis, or simply to give the same amount to each school. Glassman and the board decided that each of the 20 elementary schools would receive \$4,000, while the five junior highs would get \$8,000 apiece.

Board member Fruchter opposed this solution and continues to express serious concern about the question of equal access to computers in District 15's schools. Fruchter points out that in several schools enrollment exceeds 1,500 pupils. These schools, which serve a largely Hispanic population, tend to have few computers. Smaller schools, with enrollments of only 300 or 400 students, already have much greater per-capita access, thanks to the activities of their PTAs.

Glassman said he doesn't intend to do anything to penalize active PTAs that had brought computers into their schools before the district was in a position to help.

As is often the case, the health of computer education within District 15 will continue to depend to a high

degree on parental involvement. Says Cathy Tietz, president of the President's Council (an organization of the district's current and former PTA presidents), "How far we go depends on how concerned the parents are. If the parents have the will to act, then they can raise the necessary funds."

Tietz recognizes, though, that it is often skepticism about computers—not lack of will—that limits parental involvement. Tietz says she understands the problem since she, too, was skeptical in the beginning. Elba Haggerty was too, and expresses her initial reservations eloquently:

"I wanted to make sure that the children were aware that there were people behind computers, and not imagine that the machines were smarter than they are. After all, the computer was going to be in a position to tell them they were 'right' or 'wrong.' That can be overwhelming to kids unless they understand first that people have to program computers to make them work."

Both Tietz and Haggerty overcame their fear of computers by enrolling in one of several courses the district designed especially for the parents. Haggerty was partly responsible for the creation of these courses. She went to Glassman and said, "We feel ignorant. The children know more about computers than we do. We can't answer their questions. Can't we have computer classes for parents?"

Cathy Tietz had a similar reaction. "I'm beginning to learn for the first time how computers work. So now I know what my kids are doing in school." Her three children attend P.S. 230, where they are learning Logo in a program for gifted children.

FOR EVERYONE . . . OR NOT?

Glassman says the district's major concern now is "whether we will be able to get every kid on the computers, not only the self-starters and the gifted kids" who will be sure to get access during lunch or before and after school hours.

He says computers are inherently motivating, but it's up to creative teachers to apply their computers to projects that will involve students.

In the most recent school board campaign, Fruchter said, school-board candidates suggested stimulating teachers' imaginations by awarding \$500 grants to those with innovative classroom ideas, includ-

ing those involving computers. The district has now done just that.

Meanwhile, teachers are being offered an opportunity to educate themselves about computers through a variety of district-sponsored seminars and workshops.

GENTLE PERSUASION

Glassman recommends specific computers and software, but he doesn't dictate. The district suggests that individual schools consider the Commodore 64 and its peripherals, though, because of the versatility and low cost. Schools with existing equipment, however, are quite free to buy whatever equipment they need to maintain continuity.

Eventually, Glassman predicts, all of the district's elementary schools will introduce Logo as the preferred computer language.


Opinions on exactly how computers should be used continue to differ within the district. Some parents and educators favor the 'centralized' model of the computer lab, where computers are taught as a specialty subject, like art, music, or physical education. Others worry that computer labs will appeal to only a select group of technically-oriented students; that other students won't view the computer as an important general tool for their classes.

The 'decentralized' approach also has partisans. Here, the computers are in the classrooms and, ideally, children will apply them to existing classroom work. But this, too, can create problems—not least of them, how to keep equipment secure if it is scattered throughout every building.

Glassman says some combination of the two approaches makes the most sense. "Having youngsters first learn in a lab is economically intelligent," he suggests. "Later, they can learn to apply their skill in the classroom."

FROM SCHOOL TO HOME

Not only are computers getting into these schools and into the hands of more and more students, but they also are getting into the homes of families like the Tietzes and Haggertys, both now searching for the "right" home computers.

For 12-year-old Albert Haggerty, a sixth grader, the awaited acquisition has some of the expectation of the arrival of a new sibling. How is he preparing for the event? "I'm collecting more and more computer books all the time." 

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HOME BUSINESS

COMPUTERS THAT EARN THEIR KEEP 10 Ideas for Moonlighting Jobs

BY ROBIN RASKIN

You've shelled out a fortune for computer equipment and software. You've invested a great chunk of time and money in your computer hobby, and now you're "up and running." Wouldn't it be nice if your computer could start earning its keep?

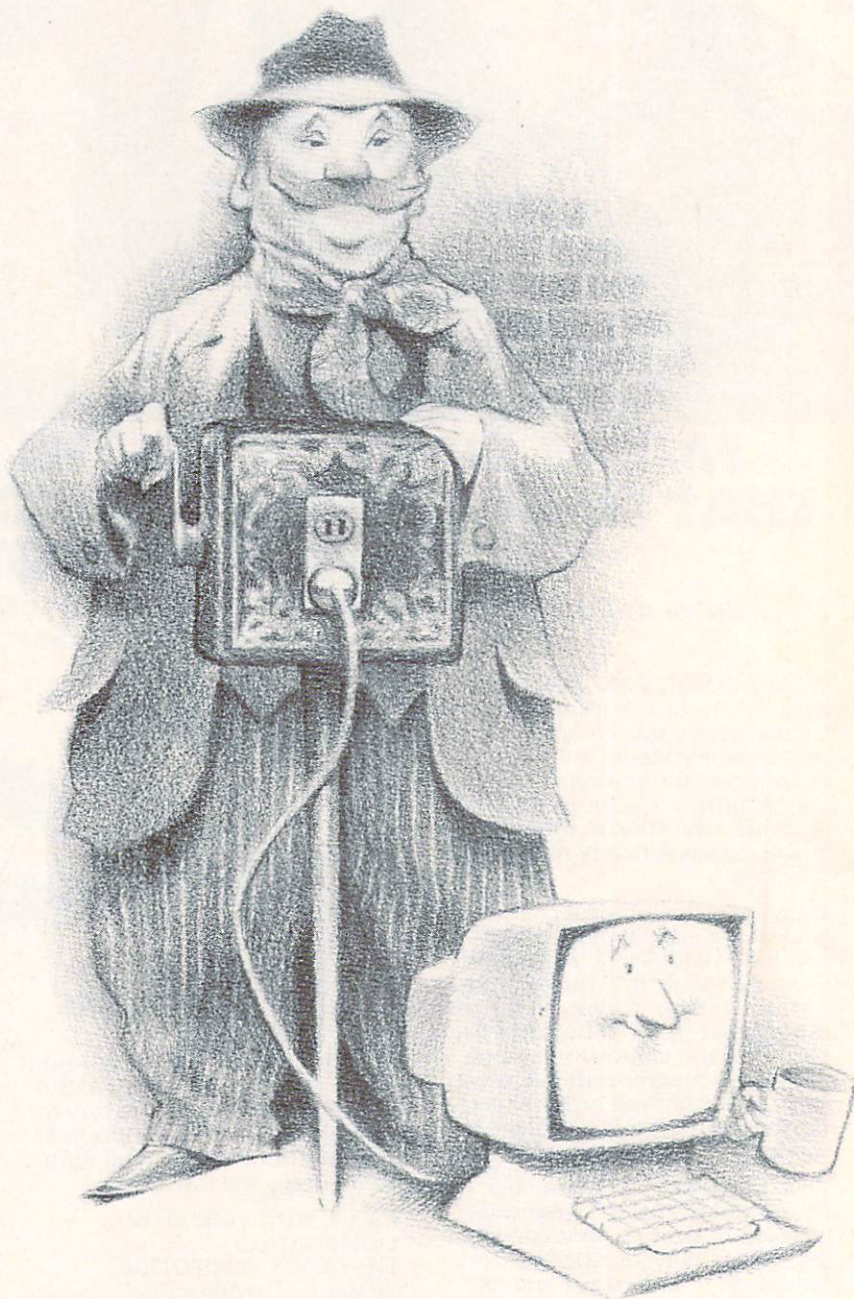
In addition to being educational, a household helper, and a nifty entertainment center, computers are very capable of bringing in a little extra "dough" when combined with the right entrepreneurial spirit. Moonlighting with your computer—that is, using the computer to earn money in your spare time—is an idea that could be worth investigating.

To moonlight successfully, you'll have to combine your computer skills with your imagination, personality, and unique talents. You'll also have to market yourself and your services, budget your time, and adhere to all your contractual agreements.

Novices beware! Computer moonlighting is not always as romantic as you might think. Operating your own business, while it can be satisfying, forces you to quickly become both jack- and master-of-all trades. Moonlighting businesses may eventually take off and provide a full-time job and salary, but it's usually a long haul before the payoff.

The key to success is pretty much the same as with any other endeavor. Find a gap in the kind of services provided on the market and then proceed to fill it. Find a niche. Because the computer field is so new and undefined, there are still plenty

ROBIN RASKIN is a contributing editor to FAMILY COMPUTING—and that helps make her computer earn its keep. Her last article was "A Data-Base Reunion," in the February issue.



of holes to fill.

I'm going to throw some of my favorite moonlighting ideas your way. I have seen most of these ideas in action and they work. Pick one that suits your fancy, bring to it your own trademark and talents—and help make your computer hobby self-supporting.

1. TEACH

EQUIPMENT NEEDED: None, but a computer is helpful.

SKILLS: Strong knowledge of one or more pieces of applications software. BASIC or Logo programming skills and familiarity with different computers a plus.

SALARY: Varies, depending on institu-

The best ... for peanuts!

Get the most computing power from your IBM/PC Jr. with these exciting Amdek monitors.

The COLOR-I accepts composite video input for complete compatibility ... and it has a built-in speaker and quality resolution. It's the most popular color monitor in the entire world!

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HOME BUSINESS

tion and course.

Teaching others about computers can be an extremely rewarding experience. In both big cities and small towns, courses are being offered for students with varying levels of computer expertise. They can range from "BASIC For Poets" to "Advanced LISP" to "The Computer and Literature." You can teach a course in applications software concentrating on any of the common spreadsheet, word-processing, or integrated-software packages.

Contact users' groups, colleges and universities, high schools, adult-education centers, after-school centers, computer camps, and alternative learning centers to find out about available positions.

You can also create your own course and contact various schools that might be interested. I know one woman who designed a technical writing curriculum and then "sold" it to a local technical college. Teaching also gives the potential moonlighter plenty of social contact. One friend who taught a course on the "C" programming language (and didn't charge a cent) wound up with a lot of freelance programming work as a direct result of the class.

Have computer, will travel? Travel to people's homes, like an old-fashioned country doctor. Get them "up and running" or offer to customize and/or give instruction on a particular application. If being a "homebody" is more your style, you can conduct informal "hands on" computer workshops in your own home. (Note, however, that because most neighborhoods are zoned as "residential," any business-oriented traffic heading into your home may upset neighbors and local authorities.)

2. WRITE

EQUIPMENT: Computer, word-processing software, and printer.

SKILLS: In-depth knowledge of computers, preferably with a specialty, and an ability to write clearly.

SALARY: Anywhere from \$25 for a short review to \$25 an hour for technical writing.

If you can write a sentence with relatively few dangling participles, and you have a lot to say about computers, try freelance writing. There are a host of computer publications. They all need material. So do local newspapers; family, school, and children's publications; and regional magazines. Short first-person stories, software and hardware reviews,

in-depth technical articles, cartoons, puzzles, interesting news items, and stories of unique applications—there's a market for all these items. Brainstorm, refine an idea, formulate a query letter, and submit it to some of your favorite local publications. "Shopper" publications, which are handed out free, are a good place to start. Amidst the disheartening rejections there may be a buyer.

In addition to magazines, there are numerous other "technical" writing markets. Somebody writes all those awful computer manuals you're always complaining about; you may be able to do better. Many in-house manuals and documents are needed by large corporations. Often, their systems staff is extremely busy and delighted to farm out the "dirty work" to moonlighters. Schools are in desperate need of comprehensive up-to-date textbooks and workbooks for computer classes.

One sharp young woman I know began as a part-time word-processing secretary to supplement her part-time opera career. She constantly wound up tutoring the other office workers when the manual was unclear. The boss finally asked her to rewrite the manual "in English." Today, she has more work than she can handle writing office-automation manuals for larger corporations. If you are technically inclined, and have excellent writing skills, you should consider the technical-writing market. The need for technical writers far exceeds their availability.

3. WORD PROCESS

EQUIPMENT: Computer, word-processing software, letter-quality printer.

SKILLS: Excellent typing and an ability to format text. Copyediting, proofreading, and layout skills are a plus.

SALARY: Approximately \$2 per printed page.

Even though this is a fairly well-entrenched area for computer moonlighters, there's always room for one more. The keys to word-processing success are speed (clients always need the thing ASAP) and an ability to make a document look "pretty."

To make it look pretty you've got to be good! You'll need a letter-quality printer, a word-processing package endowed with nifty features like italics, boldface, subscripts, headers, and footers—and you have to know how to use them.

Students with term papers, business people with annual reports, scientists with research papers—none

of these folks has the time, patience, or skill required to produce a letter-perfect document.

4. RESEARCH

EQUIPMENT: Computer, modem, telecommunications software, and printer.

SKILLS: Extensive knowledge of information services and data bases, how to access and query them, and how to "download" information.

SALARY: \$20–\$50 an hour, depending on your expertise and the connect charges of the data base you're accessing.

Obtaining information from on-line data bases is a real art. There are data bases for stockbrokers, engineers, doctors, lawyers, chemists, entertainers, gourmets (about 1,500 in all)—and they are all an "experienced" phone call away. If you have a computer, a modem, and the necessary software—and know how to use them to do on-line research—you've got a vital skill.

However, you must be able to conduct a thorough, well-targeted search of the data bases if your effort is going to be cost-efficient. You'll have to be familiar with the various on-line services, and especially their "search languages" and commands. You'll need to be able to download the required information to your own computer and print out the contents of the search so it's comprehensible to the client.

On-line research is expensive (you can pay from \$6 to \$300 an hour for connect time), so you'll have to fetch a high fee for your services in order to recoup operating costs.

You'll probably do better if you specialize in a certain field. Pick a group such as lawyers, learn their language, requirements, and database offerings—and go on-line.

5. DEAL

EQUIPMENT: None.

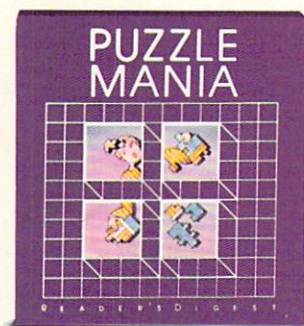
SKILLS: A flair for sales and in-depth knowledge of at least one product category.

SALARY: Sales commissions generally range from 10 to 20 percent.

If you have a flair for selling, then why not sell computers, computer peripherals, or computer-related oddities? Many small, start-up companies are looking for individuals to become dealers. They often advertise in trade magazines. And computer stores often need part-time help during evenings and weekends.

A friend, who runs his business

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Reader's Digest Software created Puzzle Mania for kids and their friends and their parents and their grandparents and everybody else who likes fun and games. Look for it at your software store or call Customer Service at 1-800-431-8800. (NY: 1-800-262-2627; AK, HI: 914-769-7000; Canada: 514-934-0751).

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Warranty information available upon request by writing to: Reader's Digest Services, Inc., Microcomputer Software Division, Pleasantville, N.Y. 10570. Puzzle Mania runs on Apple® II, II Plus, IIe, IIc (48K), Commodore® 64, IBM® PC and PCjr. Disk drive and color monitor required. Family Computing is a publication of Scholastic, Inc. Apple is a registered trademark of Apple Computer, Inc. Commodore is a registered trademark of Commodore Electronics Limited. IBM is registered trademark of International Business Machines Corp.

HOME BUSINESS

out of the houseboat he lives in, recently became a dealer for one of the IBM-compatible computers. His business has become "more than full time." He's added printers, disks, memory-expansion units, and a host of other goodies to his growing inventory.

But, rather than selling computers themselves, you'd probably do better to start out with peripherals, accessories, or computer "novelties." These are more likely to be marketed by small companies without good national distribution.

6. BUILD

EQUIPMENT: Carpentry, drafting, and/or sewing tools.

SKILLS: An ability to design and build furniture, plus knowledge of computer operations and space requirements.

SALARY: Charge by the piece.

Most people who own a computer soon find themselves working in a hardware/software jungle. If you are handy at construction or design, you can certainly help cut through the underbrush by developing customized computer furniture. You'll need to keep "ergonomic" considerations in mind, and work with the individual client to tailor the furniture to suit the environment.

And, if you like to sew, there are a number of ingenious covers and carrying cases that you can design to protect the computer or its accessories.

7. ENTERTAIN

EQUIPMENT: Computer with advanced music and color graphics capabilities, word-processing and data-base software, and a graphics printer (a speaker and a robot might be nice!).

SKILLS: A flair for entertaining, access to good entertainment software (either home-written or purchased), and a working knowledge of BASIC programming.

SALARY: \$70 for throwing a party, extra for amenities.

Let your computer take charge of a party. It'll write out the invitations and thank-you notes (with cute graphics, of course), keep the menu, seating plans, addresses, and RSVPs of the guests. It can entertain by singing songs, conducting games, and providing computerized party favors and wrapping paper.

Once the business gets established you can begin thinking about programming a SHOWBOT (a show robot) to be the "life" of the party. Par-

ents are always looking for ideas for their kids' birthdays, so you should have a good market.

8. KEEP BOOKS

EQUIPMENT: Computer; data-base management, general ledger and/or bookkeeping, spreadsheet, or integrated software; printer (a graphics printer is a plus).

SKILLS: Good knowledge of business practices (such as payroll, inventory, cash-flow management), in-depth knowledge of related software packages, and some ability to customize software.

SALARY: \$20-40 an hour.

Many small businesses don't have the time, capital, or gumption to computerize their operations. But there are some first-rate programs available for small businesses. Learn how to use them well, and then offer your services to local merchants. You can analyze their cash flow on a daily, weekly, monthly, and/or annual basis. You can keep accounts receivable and payable, payroll, and personnel records; and provide general bookkeeping and ledger functions.

In addition, most small businesses (not to mention school, cultural, political, social, and religious organizations) maintain mailing lists. They all hate handling mailing lists and would probably love the opportunity to shove the whole "kit and caboodle" your way. Once you type in the initial list, you only have to update it periodically and print out new labels whenever required. (You can generally charge 60 cents per printed label, and 50 cents for each updated label.)

Or, you might become someone's personal accountant. A businessman I know hates keeping track of his personal expenses. He turns over shoeboxes full of receipts, bills, and scrawled memos to an enterprising young kid, who in turn hands back a legible computer printout of all legitimate business expenses.

9. AUTOMATE

EQUIPMENT: Computer and tools for installing electronic devices.

SKILLS: Some electronics know-how and some programming know-how.

SALARY: Charge according to the job.

Most computer owners hesitate to get involved with household automation. On the other hand, many of these same people would probably love to see their computers playing an important part in monitoring their homes. Computers can be programmed to control lights, to oper-

ate home security or burglar alarms, and to water lawns or turn on ovens. You'll need the right remote-control system for the job, and you'll need to know how to make a computer interface with that device. (See "Automatic Pilot" in the December 1983 FAMILY COMPUTING.)

And there's software, which can be configured for particular needs, to drive these products. With a little electronics know-how, there's no telling where this moonlighting adventure can lead you.

10. TYPESET


EQUIPMENT: Computer, graphics printer, word-processing software with extensive print-formatting features (modem helpful).

SKILLS: Working knowledge of your software and printer.

SALARY: Charge according to the job.

Put your thinking cap on and come up with some dazzling designs for posters or leaflets. Then take them around to movie houses, local theaters, church groups, and civic organizations. These and other institutions offer specials and special events that need to be advertised locally. If you can make your printer do tricks—either using word-processing software or writing your own programs—you can bring a little pizzazz to advertising fliers, and you might even land a contract.

If you have a modem and are comfortable with it, you have another option. Several typesetting companies around the country will accept data sent by computers, typeset it according to your specifications, and send it back to you. This will give you a more professional-looking piece of work. Two typesetting companies to consider are: Type-Share, 5952 N. Adenmoor Ave., Lakewood, CA 90713, and Intergraphics, 106-A S. Columbus St., Alexandria, VA 22314, (800) 368-3342. (For more information, see "Typesetting by Modem" in the February 1984 FAMILY COMPUTING.)

Of course, I could go on in this vein forever. But generating ideas is only half the battle. Advertising, marketing yourself as a competent professional, negotiating realistic rates of compensation—and doing all this while you're presumably working in another job, raising a family, or going to school—is tricky and requires a real will to succeed. But, that will only make your eventual success more satisfying. 

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1. Are you aware of and familiar with the new peripheral, the Chalk Board PowerPad™ touch-tablet?
Yes ☐ No ☐ (You can find out more at your local computer store)
2. There are many unique features that are offered only on the Chalk Board PowerPad. We would like to know which is the most important to you. (Please rank 1-5)

<input type="checkbox"/> Multi-point contact capability	<input type="checkbox"/> Programmable surface
<input type="checkbox"/> Large active work surface 12" x 12"	<input type="checkbox"/> Graphics/Music/Game Design/Versatility
<input type="checkbox"/> Allows functions that cannot be performed with a keyboard.	
3. Which of the following uses of the Chalk Board PowerPad that have already been discovered do you think are most important? (Please rank 1-6)

<input type="checkbox"/> Graphics	<input type="checkbox"/> Special effects
<input type="checkbox"/> Music composition	<input type="checkbox"/> Programming
<input type="checkbox"/> Game design	<input type="checkbox"/> Learning through discovery
4. Which of the following uses of the Chalk Board PowerPad currently under development do you consider the most important? (Please rank 1-5)

<input type="checkbox"/> Free-form game play	<input type="checkbox"/> Laser disk control
<input type="checkbox"/> Test preparation (SAT, ACT, etc.)	<input type="checkbox"/> Artificial intelligence
<input type="checkbox"/> Custom video design	
5. What other uses can you imagine for the Chalk Board PowerPad.

A. _____

B. _____

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GAMES

SATISFYING OLYMPIAN APPETITES

Compete for World Records—

From the Comfort of Your Own Family Room

BY JAMES DELSON

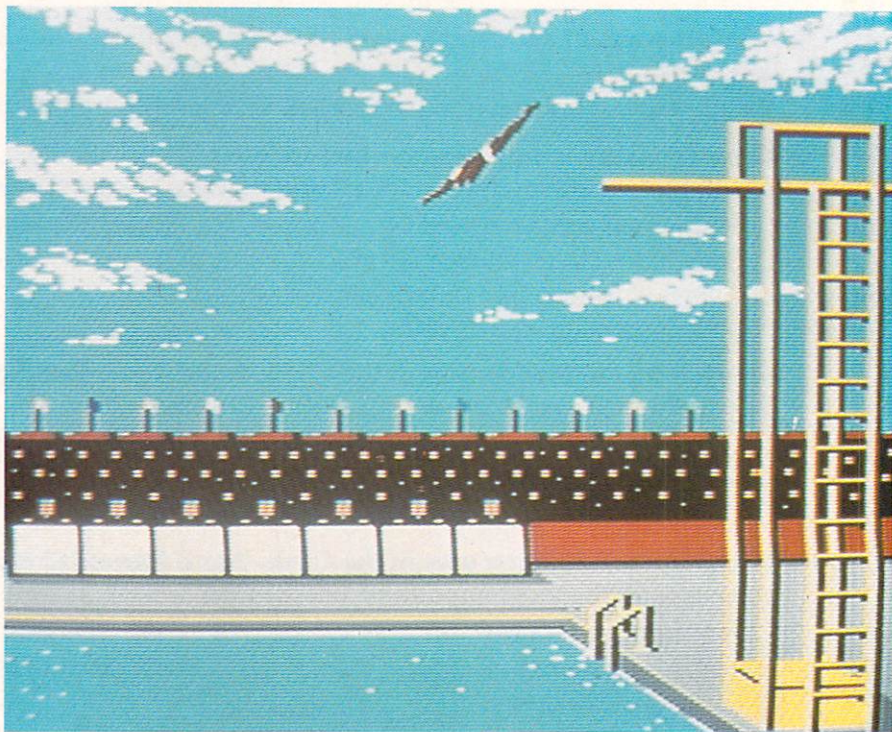
Jim McKay is on the tube proclaiming the virtues of Kenyan running champions, Dutch shot-putters, American swimmers, Russian weight lifters, and other international athletes who've come to Los Angeles in search of the fame, fortune, and personal satisfaction of competing in the Olympics. If you've ever played computerized sports games, you already know about the joys of victory and the agonies of defeat. *Microsoft Decathlon*'s been out for a year, bringing Olympic events to the home, such as the 100-meter dash, long jump, high jump, javelin throw, shot put, 400-meter run, 1500-meter run, pole vault, hammer throw, and 100-meter hurdles. But what of the other Olympic events this summer? There's an exciting roster available in computer game versions.

COULDN'T MAKE IT TO L.A.?

For those who enjoy sports, but couldn't make it to Los Angeles or who get bored simply watching others compete, there are a variety of programs that simulate the joys, agonies, defeats, victories, and even ceremonies of the sports world. Designed to satisfy the joystick aficionado's most Olympian appetites, this summer's sports games are more polished, better designed, more "realistic," and easier to play than previous years' athletic offerings. Of special note are two all new multi-event programs—*Summer Games*, from Epyx, and *Hes Games* from HesWare.

Out just in time for the 1984 summer festivities in Los Angeles, these

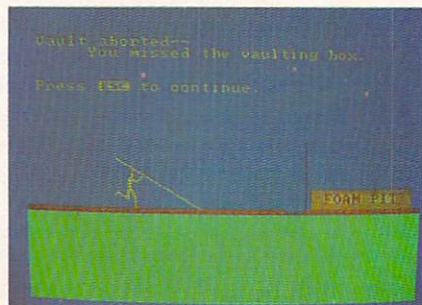
JAMES DELSON is FAMILY COMPUTING's games critic. His Olympic training consists of eating Chinese food, flicking TV channels, walking his dog, and playing the latest sports simulations.



The high dive (above), from Epyx's *Summer Games*; archery, from HesWare's *Hes Games*; and pole vault, from *Microsoft Decathlon* (both below)—all classic games simulating the joy of victory and the agony of defeat.

two each feature six different events not seen before on the superb *Decathlon* program (reviewed in the February 1984 FAMILY COMPUTING). Skeet shooting in the Epyx offering and archery from HesWare's game are aimed at the shoot-'em-up fan. *Hes Games* also has a weight-lifting event, 100-meter sprint, spring-board diving, 100-meter hurdle, and long jump. Epyx's *Summer Games* features a swimming sprint, swimming relay, high dive, pole vault, and 1200-meter dash.

Both new multi-event programs proved difficult for playtesters. Still, they were unanimously acclaimed as the most riveting sports games to date next to *Microsoft Decathlon*. They call upon players to utilize their joystick or keyboard abilities to the utmost—combining timing, coordination, and dedication (a fancy term for practice). It takes concen-



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G307-7

GAMES

tration, an understanding of the tricks necessary in each event, and even some luck to triumph over records set by human or computer opponents.

In computer fantasy games, whether you're battling monsters in a subterranean dungeon, collecting chests in *Lode Runner*, or going after the idol in *Aztec*, reality is a long jump away. The computer can deliver only so much in the way of vivid graphics or real-life simulations. Good sports games accurately simulate actual events. Using strategy skills and timing you can compete in contests that otherwise require years of training, not to mention a stadium and swimming pool!

CLOSE TO THE REAL THINGS

Hes Games and *Summer Games*, and their predecessor, *Microsoft Decathlon*, are so good because their designers and programmers have been able to recreate something very close to the actual event. The best examples for me of this realism are the pole vault in *Microsoft Decathlon*, archery in *Hes Games*, and the high dive in *Summer Games*. As a fan, I've watched these events frequently. As an amateur, I've even tried my hand at a few.

Decathlon's pole vault is one of the most difficult and rewarding programs I've encountered. Just as in real life, you must figure out the length of your approach, then, pole (held at the appropriate position) in hand, run up to the vaulting box. Plant the pole, swing up to the bar, and just at the right moment, spring over. Some players have found this event so difficult that they swear they'll never be able to master it. But with sufficient practice you can get over that bar.

Mastering the archery competition in *Hes Games* is more than simply a matter of aiming and shooting. You must nock an arrow, draw the string back, and then maneuver the joystick to aim at one of four targets set at graduated distances. The moment you draw the string your strength begins to dwindle, so your aiming power disintegrates as well. You have to shoot quickly, taking the wind's strength and direction into account, or you'll never score well.

Of all the events we tested, *Summer Games'* high dive is the most graceful. Choose from four different

positions as you plummet towards the water from the high board. Press a button to take off, then move the joystick to right, left, bottom, or top to choose whether you'll fall in a tuck, pike, half-pike, or layout. Watching your line of descent, you must then come out of your position to enter the water in a clean, crisp vertical line. Seven judges rate your

OLYMPIC SOFTWARE MANUFACTURERS

Avalon Hill, (301) 254-5300, makes *Tournament Golf* for Apple, 48K (disk). Version planned for Commodore 64. \$30

Avant-Garde, (503) 345-3043, makes *Hi-Res Computer Golf II* for Apple, 48K (disk). \$34.95

Coleco, (800) 842-1225, makes *Rocky* for the ADAM (cartridge). \$30

Commodore, (215) 431-9100, makes *International Soccer* for the Commodore 64 (cartridge). Approx. \$35

Electronic Arts, (415) 571-7171, makes *Julius Erving and Larry Bird Go One-on-One* for Apple, 48K (disk); Atari, 32K (disk); Commodore 64 (disk). \$40

Epyx, (408) 745-0700, makes *Summer Games* for Commodore 64 (disk). Versions planned for Apple, Atari, Coleco ADAM, and IBM PC/PCjr. Approx. \$40

HesWare, (800) 227-6703, makes *Hes Games* for Commodore 64 (disk). Version planned for Apple. \$39.95

HomeComputer Software, (408) 735-8400, makes *Pro Golf* for Apple, 48K (disk); Commodore 64 (disk). \$39.95

Howard W. Sams Co., (800) 428-7267, makes *Bermuda Race* and *Regatta* for Apple, 48K (disk). \$29.95

Microsoft, (206) 828-8080, makes *Microsoft Decathlon* for Apple, 48K (disk); IBM PC, 64K (disk). \$39.95

Strategic Simulations, (415) 964-1353, makes *Professional Tour Golf* and *Ringside Seat* for Apple, 48K (disk); Commodore 64 (disk). \$39.95

Thorn EMI, (714) 751-3778, makes *Soccer* for Atari, 16K (cartridge). \$44.95

performance and the computer recalculates your score for the degree of difficulty.

If you've suffered through countless real-life face, back, and belly flops like I have, you'll really feel the impact when you don't perform well in this program. The cries of pain and laughter that accompanied unsuccessful dives were nonstop as playtesters tried their luck at this event, vying for that coveted score of 10.

Hes Games and *Summer Games* are a must for Commodore 64 owners. Versions of *Summer Games* should be available for the Apple, Atari, Coleco ADAM, and IBM PC/PCjr soon. *Decathlon* is a requisite part of any IBM or Apple owner's collection.

OTHER OLYMPIC EVENTS


In addition to these exciting multi-event programs, a wide variety of other Olympic sports are represented in single-contest programs.

Yachting and small-craft sailing are computerized in *Bermuda Race* and *Regatta*, by Howard W. Sams Co. For basketball, check out *Julius Erving and Larry Bird Go One-on-One*, from Electronic Arts.

There are a number of golfing simulations, too: *Professional Tour Golf* (Strategic Simulations), *Pro Golf* (HomeComputer Software), *Tournament Golf* (Avalon Hill), and *Hi-Res Computer Golf II* (Avant-Garde). On the less delicate and more action-oriented side are the boxing games—*Rocky* from Coleco and *Ringside Seat* from Strategic Simulations.

For fast action games great for more than one player at a time, soccer simulations like *International Soccer* from Commodore and Thorn EMI's *Soccer* are worth looking into.

Sports games are an unbeatable value. Apart from their refreshing lack of violence, they are perfectly suited for groups. Loaded with good sports software, the computer has a remarkable capacity to simulate the effect of wind on sails, a long drive up the fairway, or the split-second timing required for a graceful one-and-a-half dive.

Don't spend the whole summer glued to the screen. But when you're stuck in front of the television, waiting for the umpteenth heat of the water-polo contest, boot up one of these games and set a world record or two. 



A FOUR STAR WINNER!

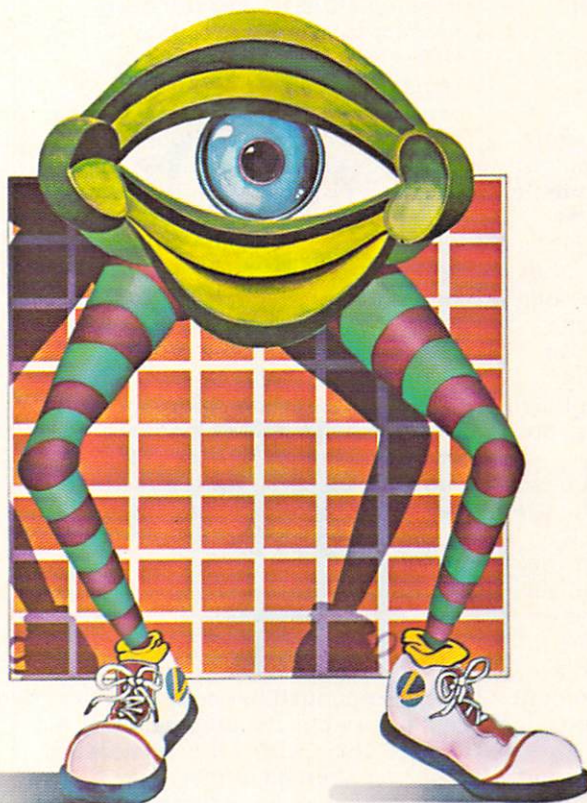
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COMPUTING CLINIC

EDUCATIONAL CP/M PROGRAMS/ DATA STATEMENTS/PRINTERS FOR THE TI-99/4A

BY JEFFREY BAIRSTOW

How can FAMILY COMPUTING's program listings be modified to work on CP/M-based computers? I have a Kaypro II, which I use for word processing, but I would like to have my daughters in fourth and sixth grade use the unit as well. Where can I find educational games or even "fun" games in CP/M?

JOHN C. CARLISLE
Hammond, Indiana

This is a question asked frequently by FAMILY COMPUTING readers who own CP/M-based computers. Unfortunately, there are no easy answers. Assuming that your Kaypro computer has either SBASIC or MBASIC, the simpler program listings from FAMILY COMPUTING can be converted quite easily, provided that the program does not make use of POKES and PEEKS, or special music or graphics statements such as LINE, COLOR, or SOUND.

A good starting point would be to use the program listings for the IBM PC. Type the listing into your Kaypro, correcting syntax errors if they occur, and then attempt to run the program. However, be prepared to spend some time debugging the modified programs. You'll need a good understanding of your computer's BASIC to adapt the programs successfully.

As for CP/M games and educational programs for the Kaypro—unfortunately the library is sparse. That's because CP/M machines are primarily business oriented, and because game programs make use of the special color graphics capabilities (especially on Atari and Commodore computers) which aren't available on the Kaypro. Some adventure games that are all text-oriented, such as those published by Infocom, will run on Kaypros.

JEFFREY BAIRSTOW, a technical journalist who lives in West Redding, Connecticut, was a founder and managing editor of Computer Decisions magazine. He has also taught math and computer science in England. His family, including two preschoolers, uses a variety of computers.

However, you do have a few choices. Kaypro offers seven educational "modules," so-called because they often consist of more than one disk. These modules cover course work for both elementary and high school students—on topics such as arithmetic, science, chemistry, and learning MBASIC. For price and product information, contact Lillian Heller, who is in charge of educational software at Kaypro, 533 Stevens Ave., Solana Beach, CA 92075; (619) 481-3977. In addition, Krell Software, (516) 751-5139, is introducing a program that helps students prepare for the SAT exams. And The LISP Company, (408) 354-3668, is selling a version of Logo, the programming language used in many schools, for the Kaypro. (TLC Logo will sell for about \$100.)

My manuals do not explain very well what a DATA statement does. This makes it hard for me to proof [debug] programs. Can you help?

MARK ADKINS
Omaha, Nebraska

In a BASIC program, a DATA statement is simply a line with a list of items, separated by commas, that can be used by the program once it "reads" them with a READ statement. The items can be numbers or strings of characters (such as people's names), that must match up with the types of the variable (e.g. numeric or string) used in the READ statement. DATA statements generally can be placed anywhere in a program, but good programmers usually put them at the end.

A typical use of DATA and READ statements is exhibited in this simple program:

```
10 READ A,B,C
20 DATA 10,20,30
30 PRINT A,B,C
```

This program will print the three numbers 10,20,30 on the screen. The READ statement literally reads the data list, item by item, in line 20 and assigns the value 10 to variable A, 20 to variable B, and 30 to variable

C. Line 30 then prints the values of each variable—in this case, 10,20,30.

DATA statements are useful for data items that become permanent parts of a program. Data items that need to be changed, say for updating, should be maintained in separate files.

Common problems in using DATA statements include mismatching the types of variables and data, and having fewer items than there are READ statement variables. The items in the DATA statement must agree with those in the READ statement. That's to say, a string variable must match with string data, and a numeric variable must match with numeric data. And, if the READ statement has five variables, then there must be at least five items in the DATA list.

I own a TI-99/4A with the Peripheral Expansion Box and would like to hook up a printer such as the Brother CE-50. Will I need an RS-232 interface card?

THOMAS CINTRON
Berkeley, California

It is possible to use non-TI printers with the TI-99/4A. (The Brother CE-50, which is primarily a typewriter, also requires Brother's IF-50 unit, priced at \$299.95.) You will need either an RS-232C interface card (which inserts into the expansion box) or an RS-232C interface adapter (which plugs into the right-hand side of the console). Mikel's RS-232C Interface System is an example ([213] 532-3029). You will also need a cable to connect the printer to the card. Suitable cables are available from TI dealers or from a number of mail-order companies.

Instructions for sending output from the 99/4A to a printer are contained in the TI manual for the RS-232C interface. You may have to reset some of the DIP switches on the Brother's IF-50 to make sure it responds correctly to signals from the computer. The manual should have instructions for setting the switches, but you may have to experiment a little. **FC**

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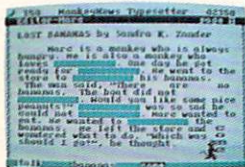
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Monkeymath

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Monkeynews

For help with spelling and vocabulary, choose **Monkeybuilder[™]**. It encourages the child to combine word pieces correctly to form building blocks, and make a tree house for Marc.

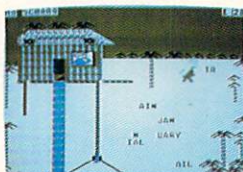
All three programs are more fun than a barrel of you-know-whats!

All are available for the Commodore 64, Atari, and Apple computers. All include a FREE Marc the Monkey story and coloring book. And they're all the stuff top bananas are made of!

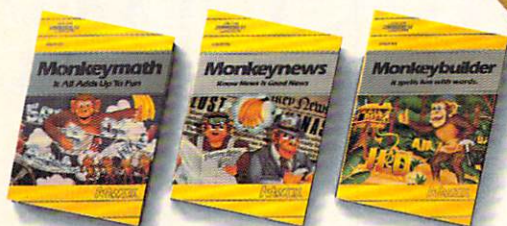
See them in action wherever software is sold. To find out more facts, send \$1.00 for a colorful catalog to: Artworx Software Co., Inc. 150 North Main Street, Fairport, NY 14450.

Or call: 800-828-6573.

(In New York call: 716-425-2833).



Monkeybuilder



Monkeymath
by Dennis Zander

Monkeynews
by Dennis Zander

Monkeybuilder
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PCjr was designed to make the whole family feel at home with computers.

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You can start using PCjr as soon as you set it up. The Sampler Diskette (included with diskette-drive models) gives you eleven useful mini-programs to choose from.

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1. Home Loan

2. Monthly Expenses

3. Word Race

4. Shopping List

5. Recipe File

6. Tile Game

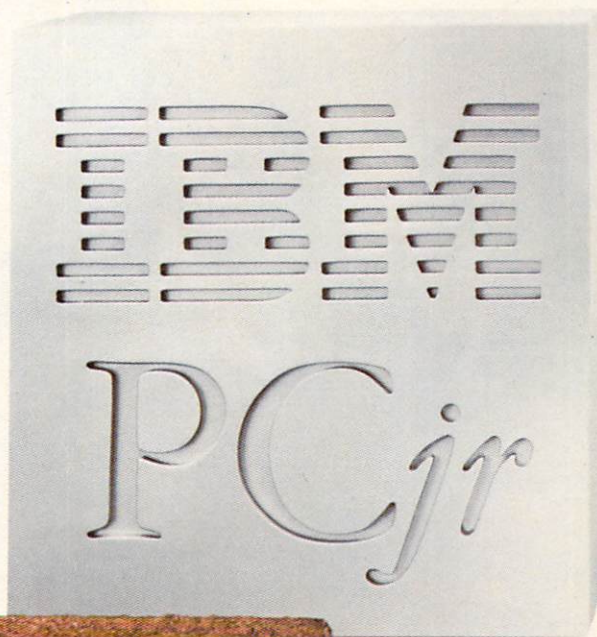
7. Typewriter

8. Alarm Clock

9. Checkbook

10. Address Book

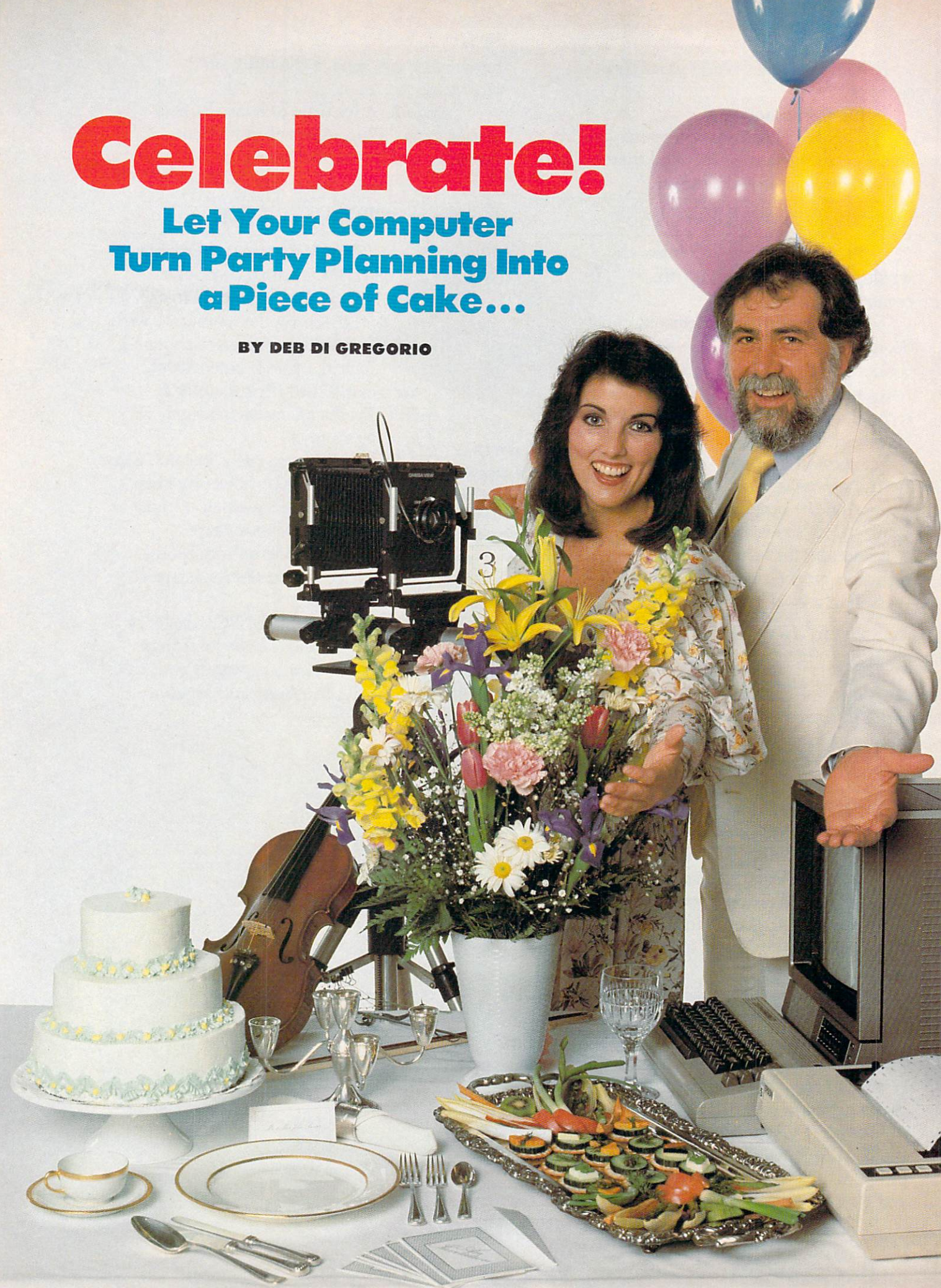
11. Telephone Connector

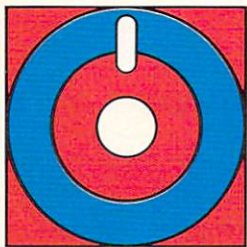


Celebrate!

**Let Your Computer
Turn Party Planning Into
a Piece of Cake...**

BY DEB DI GREGORIO





...And Say Goodbye to Paper Scraps, Worn Erasers, and Hours of Aggravation!

wish I'd had a computer 20 years ago when I planned my wedding!"

So says 42-year-old Marilyn Savoia of Ridgewood, New Jersey, who is using her IBM PC and *VisiFile* data-base manager to organize her own college graduation party.

She got the PC as a gift from her parents after she told them she intended to go to law school. She originally bought *VisiFile* to keep track of term paper footnotes. But now the program has a very different, equally challenging assignment.

Marilyn first came to Ramapo College (in Mahwah, New Jersey) 12 years ago, as a clerk typist. She worked her way up to administrative assistant and then quit her job to attend school full time. During the years at college, she made many friends. Now that she's about to graduate, all those friends are eager to celebrate her accomplishments. Since she can't afford a sit-down dinner, Marilyn has asked each of her 50 guests to bring something. *VisiFile* is keeping track of everything from potato salad to music, from set up to clean up.

"The nice thing about working with a data-base program is that once the information is in there, you can forget about it," she said. After spending a couple of hours setting up the data base, she has spent no more than a few minutes a week updating her files. "This is my last semester. I can't spend much more time than that."

Three weeks before the party, she will send out personalized invitations created by her computer. The invitations will remind people of what they have promised to bring and do.

According to Marilyn, people are very excited. "We are quite a crazy group, everyone is a real ham. When we have parties there are skits, speeches, and costumes. It looks like it's going to be a real good time for all!"

YOU CAN DO EVEN MORE

Graduation parties, weddings, class reunions, golden anniversary celebrations, bar mitzvah and confirmation parties, fund-raising dinners—we've all been guests at events such as these, but rarely are we hosts. Inevitably, planning a huge gathering is a full-time, difficult job.

The computer, with the aid of a data-base program, spreadsheet, and word processor, can be your perfect, ever-devoted party-planning assistant.

Why use your computer?

1. It can help keep you organized. For example, once you've set up a data base to keep track of your guests, it's much easier to see what essential information is missing. (Has Uncle George RSVP'd yet?) If nothing else, it's easier to handle information on just a few disks than to contend with shoe boxes full of papers. The more complicated the party, the more time your computer can save you.

2. Using a computer spreadsheet program can help you see how much your ideal affair will cost. If it's too much, you can, at the touch of a key, see how much you'll save if you cut 10 guests, or keep the bar open one less hour, or provide your own cake.

3. A data-base program will help you keep track of address lists, who's coming, where



Freelance writer DEB DI GREGORIO of Ridgewood, New Jersey, is a computer consultant and editor, and has written for a variety of national magazines.

they will be seated, and whether they'll need accommodations. After the party, you can use the program to keep track of thank-you notes.

4. Planning your party can be a perfect opportunity to get more familiar with your software—or to acquire new software that will be useful to you in the future.

Inspired in part by Marilyn Savoia's experience, I decided to apply computer technology to the planning of large affairs—in particular, catered affairs that require exhaustive planning and decision making. If you stick to the following steps, you'll be able to find all your "planning" and "things to do" lists and notes on one disk, your budget records on another, and information about your guests on a third. (It's all diagrammed on the next four pages.)

THE FIRST STEP

Imagine the general outlines of the affair. Let's say you're planning your parents' wedding anniversary dinner. You want to invite about 100 people, each of whom would pay their own way. You're thinking of a light sit-down dinner, flowers on each table, and a small dance band for entertainment. Using your word processor, list each category: flowers, band, dinner, etc. Note the items you will have to buy or rent.

Then, list each "thing to do."

Next, create separate files for each item that must be bought or rented. These are your "callsheets"—so named because you'll use them as a basis for making your price comparison phone calls. (See my version of a restaurant callsheet in the accompanying example. Of course, it can be modified to fit your needs.)

An 80-column word processor that can set tabs is ideal for this. If yours displays fewer characters, you may be more comfortable sticking to paper and pencil. The advantage of a word processor here is that it will let you easily insert each new consideration as you think of it, and allow you to print out clean "forms" to write on when you begin contacting vendors.

Now, you're ready to do some preliminary research on prices and options. Prices may differ greatly, even within your own neighborhood.

In order to do effective comparison shopping, you should tentatively decide what kind of menu you want—at least as a starting point. For the golden anniversary party, I have chosen a chicken dinner without dessert, and an open bar. I type that information across the top of my restaurant callsheet.

Then, just below, across the screen (or page) list the names of caterers to call. My spreadsheet will provide room to compare three caterers.

Your caterer callsheet should include all caterer-related costs. That means, at minimum, food, alcohol, a tip for the maitre d', a gratuity for the staff, and taxes.

Your callsheets are the outline for your computer spreadsheet. Now make those phone calls and fill in the blanks. Don't compute the

totals or the tax. The computer will do that for you later.

Repeat the process for the other goods and services. Remember, first narrow down what you are looking for. Visiting a vendor is a good way to do this.

ACCOUNTING FOR EVERYTHING

Here are some other items you will probably need to consider in making up your callsheets:

Flowers: Count how many centerpieces you will need. Will you need to buy corsages and boutonnieres? Are there delivery charges?

Photographers: Some photographers offer package deals, others don't.

Invitations: You will probably need fewer than the total number of guests, since many of your invitations will be sent to couples. However, in many cases, printers require a minimum order. Will you include RSVP cards and envelopes? Don't forget about postage.

Music: Musicians' prices vary greatly, and bands usually charge a union tax. An alternative is to use a DJ or make your own tapes.

Limousine Services: Generally, limousines charge by the hour and require you to pay for a minimum amount of time. Drivers expect a tip.

GREAT SPREADSHEET, GREAT SPREAD

Once you have filled in all your callsheets, load your spreadsheet program. I used *VisiCalc*, but there are other programs that work the same way. You can see on my spreadsheet model how I developed the caterer portion, step-by-step. Your spreadsheet should include not only a caterer section, but also sections for each of your expense items.

When your spreadsheet is complete, it will do all your calculations, break down the total cost per person, and let you analyze any and all options in a section that will look like a "final analysis."

With the budget behind you, a date set, and decisions on vendors made, the next major area to tackle is compiling the addresses of all the guests. Boot up your data-base management or filing program, and, using my sample data-base record as a starting point, set up your own.

"FETE ACCOMPLI"

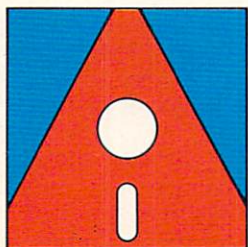
The more complicated your affair, the more you'll probably need the organizational aid of a computer. You could manage the old-fashioned way. Or, you may only need your computer to help arrange parts of your party. But it's good to know, before you're overwhelmed by the thought of planning a big catered affair, that you can get all the electronic help you need, just for the asking.

Who knows, you might just start calling your computer "Jeeves" and ringing a bell before turning it on!

**DON'T COMPUTE
THE TOTALS OR
THE TAX. THE
COMPUTER WILL
DO THAT FOR
YOU ...**

PLANNING YOUR PARTY WITH A COMPUTER IS (ALMOST) AS EASY AS A, B, C...

This is a step-by-step guide to using word-processing, spreadsheet, and data-base software in the planning of a large, catered anniversary party—but you can use the ideas here for any kind of festivity. If you aren't yet familiar with these types of software, these pages will give you a better idea of how they work—and how they can help you in any real-life situation that demands financial planning and complicated record-keeping.



PUT YOUR IDEAS INTO A WORD PROCESSOR

1. Start with your list of things to do...

1. Gather names of restaurants and vendors from friends.
2. Picture the event in your mind, and make a list of items to be purchased or rented.
3. Narrow down choices for the menu, flowers, etc.
4. Create "callsheets."
5. Telephone vendors for prices.
6. Create your budget spreadsheet.
7. Input callsheet data to spreadsheet.
8. Decide which vendors to use; set date.
9. Order goods and services.
10. Gather addresses.
11. Create "guest data base."
12. Input addresses.
13. Mail invitations.
14. As RSVPs arrive, fill in a Y for Yes or N for No in the "RSVP" field.
15. As checks arrive, fill in a Y for Yes or N for No in the "check paid" field.
16. Make hotel arrangements for guests who need them, and fill in appropriate data in data base.
17. Periodically check who has yet to RSVP.
18. Figure out the seating arrangement, by using a sheet of paper for each table and jotting down names from the master data base. Input the table numbers in the "Table #" field, and make a printout. If you're not satisfied, juggle the numbers around on the data base until you are.

2. Then develop a "callsheet" for each type of expense...

Caterer Callsheet:			
Dinner for:	100 guests		
Menu:	Chicken		
Bar:	5 Hours Open Bar		
Caterer:	A Oak B The C Chez Tree Inn Overlook Pierre		
Food Cost Per Person	\$16.00	\$10.95	\$18.00
Food Total			
1st Hour Open Bar	\$5.00	\$5.00	\$6.50
Each Extra Hr. Bar	\$3.50	\$3.50	\$3.50
5 Hrs. Bar (Tl.)			
% Gratuity	15%	15%	18%
Gratuity			
Tip Maitre D'	\$50.00	\$50.00	\$75.00
% Tax	6%	6%	8%
Tax			
Notes: Oak Tree Inn: Sue & John say food is great - down home style The Overlook: food OK, View terrific Chez Pierre: Tres Chic, Tres Expensive, Food magnificent.			

You can either create your callsheets on a word processor or do them by hand. (They're called "callsheets" because when you're done with them you'll know who you have to call.) At left is my caterer callsheet, which should give you an idea of the kinds of things you'll have to consider in developing yours.

Once you've finished creating a callsheet for each expense, print it out. Then make your phone calls and fill in the prices and details quoted by vendors.

Leave space on each callsheet to jot down your impressions and feelings, and pay attention to these "gut reactions." Not everything is quantifiable.

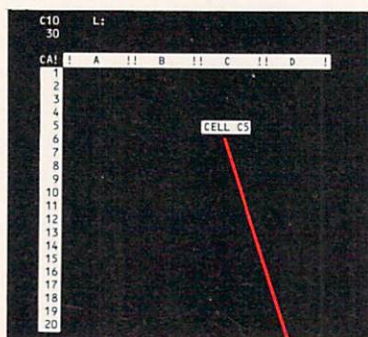
PUT ALL YOUR NUMBERS INTO A SPREADSHEET

Here's an example of how a spreadsheet program can help you save time in planning an event.

Assume you've compiled all your information and you find you're \$1,000 over budget. How much would you save if you closed the bar down an hour early? Tap a few keys and your spreadsheet will tell you. All right, how about two hours? OK, getting close. You need to save another \$300. You look at the screen. You can save \$287.50 by skipping the limousine, but you like your honored guests to arrive in style. How much would you have to cut the invitation list by to save the same amount? Tap, tap, tap . . . seven guests.

It's been just moments, but you've already got all the information you need to make your decision. If you'd done it the old-fashioned way it would have taken much longer.

1. Start with a blank spreadsheet



Typical cell

To make a spreadsheet do what you want, you first have to "program" it with instructions. I'll be showing you the set of instructions I developed to put my caterer callsheet onto *VisiCalc*. But first, here's some background on how it works.

A spreadsheet screen is a giant grid divided into squares. Each square is called a "cell" and is identified by a letter and a number. For example, the fifth cell in the third column would be named C5.

Cells may be used as "labels," to define categories of information. In my caterer example, COST PER PERSON is one such label. Whenever you look at that cell, you'll see the label, and you'll know that the columns next to it will relate to food cost per person. A cell may also contain a number or a formula.

Any time you change any number in a spreadsheet, all the numbers affected by it will automatically change.

2. Then enter labels and formulas...

Here's how I've put my caterer callsheet onto *VisiCalc*, the best-known spreadsheet program. (While not every spreadsheet uses exactly the same commands, the principles are the same. And "workalike" programs, which use commands identical to *VisiCalc*'s, are commonplace.) By typing the following set of instructions, you will be moving around on the blank spreadsheet, filling in labels and formulas where they are needed. As you type, you'll see your spreadsheet take shape. When you're done, it will look like the example shown in section No. 3, except that the three columns of numbers will be missing. You'll add those later from your own callsheet.

You'll need to know:

→ means press the right arrow key (or your equivalent).
> means "Go to." (For example, >A16 means go to cell A16. You can also use your cursor control keys.) [R] means hit the RETURN or ENTER key.

```

a. /GC15 [R]
b. /GFR
c. >A1 [R] Anniversary → Dinner → Budget [R]
d. >A4 [R] No. of Guests: → 100 [R]
e. >A7 [R] Caterer Costs [R]
f. >B9 [R] Caterer A → Caterer B → Caterer C [R]
g. >A11 [R] Food Per Person: → /F$ → /F$ → /F$
h. >A12 [R] Food Total: → /F$+B11*B4 [R] /R [R] C12.D12 [R] RN
i. >A13 [R] "1st Hr. Bar Per Person → /F$ → /F$ → /F$
j. >A14 [R] "Each Extra Hr. Bar → /F$ → /F$ → /F$
k. >A15 [R] "5 Hr. Bar (T1.) → /F$ (B13*B4)+(B14*B4*4) [R] /R [R] C15.D15 [R] RNRN
l. >A16 [R] "% Gratuity [R]
m. >A17 [R] Gratuity → /F$+(B12+B15)*B16*.01 [R] /R [R] C17.D17 [R] RRR
n. >A18 [R] Tip Maitre D' → /F$ → /F$ → /F$
o. >A19 [R] "% Tax [R]
p. >A20 [R] Tax → /F$(B12+B15)*B19*.01 [R] /R [R] C20.D20 [R] RRR
q. >A21 [R] /-- [R] /R [R] B21.D21
r. >A22 [R] Total → /F$@SUM(B12,B15,B17,B18,B20) [R] /R [R] C22.D22 [R] RRRRR
s. >A24 [R] Cost Per Person → /F$+B22/B4 [R] /R [R] C24.D24 [R] RN
  
```

Cell number

Label

Formula

3. Now add your own names and numbers...

Now, go back to the prices you got from the vendors when you were researching your own callsheet, and type them into the appropriate cells on the spreadsheet. (You can move from cell to cell by using your cursor control keys.) Also, type the names of the caterers you've chosen into the cells labeled CATERER A, CATERER B, and CATERER C. The number "100" will appear next to NO. OF GUESTS. You can change it to anything you want, and when you do, all the numbers on your spreadsheet will change accordingly.

ANNIVERSARY	CATERER	BUDGET	
NO. OF GUESTS:	100		
DINNER COSTS			
	CATERER A	CATERER B	CATERER C
FOOD PER PERSON	16.00	10.95	18.00
FOOD TOTAL:	1600.00	1095.00	1800.00
1ST HR. BAR PER	5.00	5.00	6.50
EACH EXTRA HR.B	3.50	3.50	3.50
5 HR. BAR (TL.)	1900.00	1900.00	2050.00
%GRATUITY	15.00	15	18
GRATUITY	525.00	449.25	693.00
TIP MAITRE D'	50.00	50.00	75.00
% TAX	6	6	8
TAX	210.00	179.70	308.00

TOTAL	4285.00	3673.95	4926.00
PER PERSON COST	42.85	36.74	49.26

4. Do the same thing for all other expenses...

In my model, the title and the caterer's portion of the spreadsheet will appear in the top left-hand corner. Other categories I have included, such as FLORIST, PHOTOGRAPHER, and BAKERY would appear elsewhere. At the bottom is my final analysis, where all these categories are brought together.



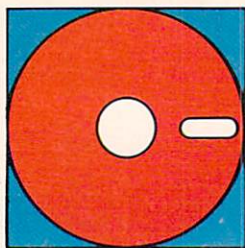
5. And bring it all together in the final analysis!

Here's where I can see, at a glance, the effect that any change in any category will have on the overall cost of the affair.

FINAL ANALYSIS						
	PREFERRED VENDO	TOTAL COST	SECOND CHOICE	TOTAL COST	LEAST EXP.	TOTAL COST
CATERER	OAK TREE INN	4285.00	CHEZ PIERRE	4926.00	THE OVERLOOK	3673.95
FLORIST	GREENLAND LTD	254.00	CHLORO PHIL'S	240.00	ROSIE'S	171.76
PHOTOGRAPHER	STUDIO 97	530.00	JERRY SMITH	583.00	CAMERAWORKS	450.50
BAKERY	SWEETY PIE'S	192.24	TENTH ST. BAKE	169.60	TERRY'S CAKES	119.70
PRINTER	QUICKPRINT	84.00	QUALITY PRINT	605.00	INVITES BY JON	26.50
POSTAGE		40.00		40.00		40.00
BAND OR D.J.	CHORD ORCHESTRA	825.00	GEORGE WYATT	605.00	TOMMY'S FRIEND	605.00
LIMO	MAXIE'S	287.50	O'BRIEN'S	258.75	LIMOS, INC.	139.20
TOTAL		6497.74		7427.35		5226.61
COST PER PERSON		64.98		74.27		52.27

This line shows how the caterers portion of this model fits in.

If you want a copy of the full instructions to Deb Di Gregorio's party-planning spreadsheet, please send a stamped, self-addressed envelope to: Party Spreadsheet, c/o FAMILY COMPUTING, 730 Broadway, New York, NY 10003. There are versions of VisiCalc for the Atari 800, IBM PC/PCjr, Apple II/II plus/IIe, and TRS-80 Models III/4 computers. Please specify which computer you own.



PUT YOUR GUEST INFO INTO A DATA BASE

A data-base manager is a program that allows you to organize information so that it can be retrieved, sorted, and updated easily. As with other kinds of software, it has its own special vocabulary. Your "data base," quite simply, is all the information you've collected on all subjects. Each subject in your data base is called a "file" and every "index card" in each file is a record. Finally, each category of information on a "record," for example, last name, first name, etc., is called a "field."

What makes the best data-base management programs so effective is they enable you to sort and retrieve records alphabetically, by zip code, or even by whether a guest has a "Q" in his or her address, if you so wanted.

Some programs, like *VisiFile*, include "key" or "index" fields. Records can be retrieved faster by key fields than by other fields. Programs vary widely in the number of key fields they permit you to use. Key your fields so you can efficiently retrieve the information you'll need most often.

In using a data base, you'll first have to create a format for your records. You will need to name your fields, possibly specify key fields, how many characters each field is likely to require, and what format each field of information will be entered in: letters, numbers, or both.

Be careful to input information consistently. If you start entering capital "Y"s, be sure to always enter a capital "Y."

At a minimum, you can use a data-base management program simply to create an address list. But, if you use it to keep track of more information, you're likely to save more time.

Another feature of data-base and mailing-list programs—one that is an especially valuable timesaver—is the ability to print out labels. (See sample.) At the risk of offending Emily Post and other traditionalists, you might find yourself at the vanguard of a new technological etiquette.

1. Deb Di Gregorio's sample data base:

Fields:	Data:	No. of Characters Per Field:	Type of Information:
Salutation:	Mr. and Mrs.	11	
First Name(s):	John and Mary	15	
*Last Name:	Partygoer	15	
Street:	35 Park Place	20	
Town:	Atlantic City	20	
State:	NJ	2	
*Zip:	08401	5	
Phone:	(609) 555-1234	14	
*Invitation Sent?	Y	1	Y=Yes N=No
*RSVP?	Y	1	Y,N, or Blank
*Check received?	Y	1	Y=Yes N=No
*Table #	5	2	#'s 1-99
*Hotel Reserv's?	Y	1	Y=Yes N=No
*Hotel Name:	Insomniac Hollow	15	
For Dates:	12/01-12/04	11	Dates
*# of Rooms:	1	1	#'s 1-9
*Single:	0	1	#'s 1-9
*Double:	1	1	#'s 1-9
*Key field			

Here's the format for my guest data base. Asterisks mark the key fields.

In my sample, I've added fields for PHONE, INVITATION SENT?, RSVP?, TABLE #, and hotel information. As the RSVPs start arriving, you'll enter a "Y" or an "N" in that field. At the end of each week you can see who is definitely coming by asking the computer to print out all records with the field RSVP equal to "Y."

As the date of the event nears, keep updating your data base. It won't take long. You can, of course, use different fields from mine. (See Marilyn Savoia's variation.) But it's a good idea to carefully plan your data base format ahead of time—and some software may not allow for changes in format once the data base is set up.

A sample label:

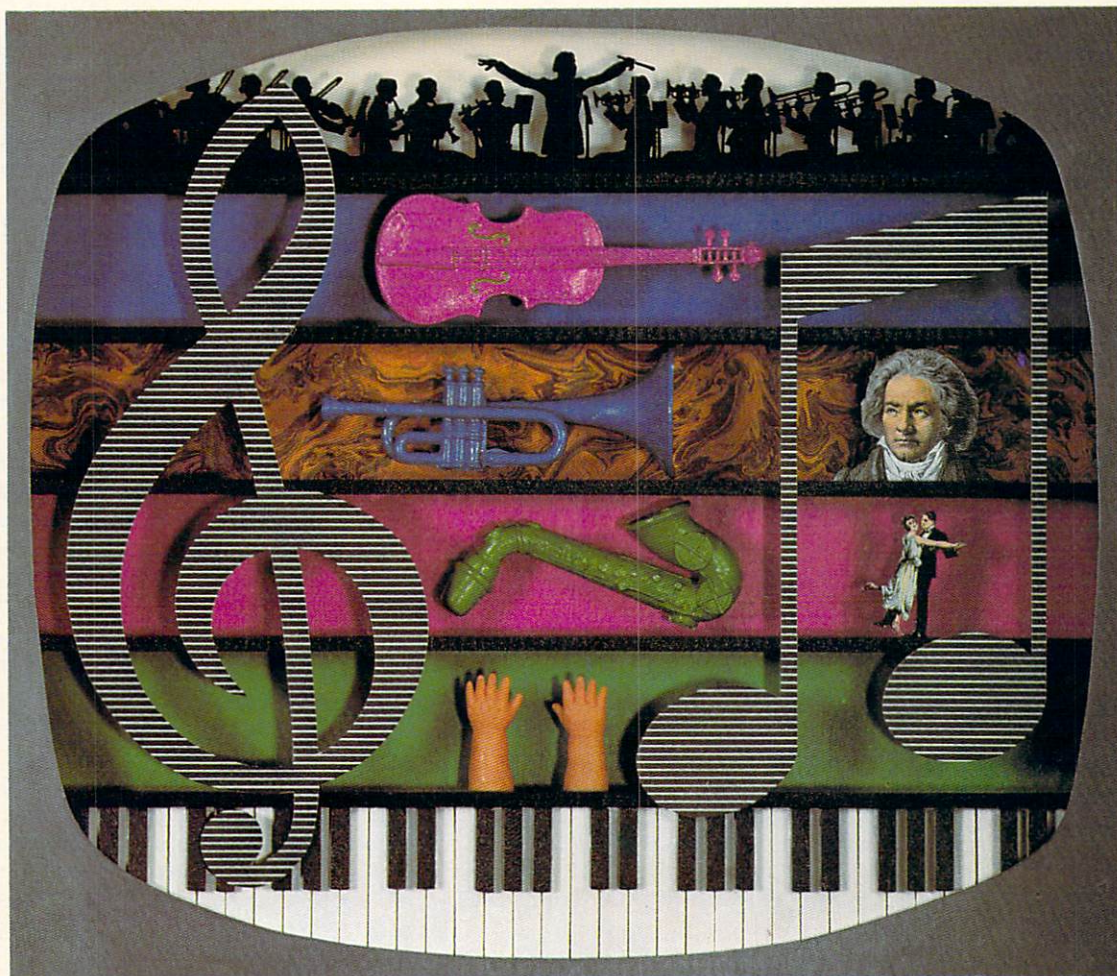
Mr. and Mrs. John and Mary Partygoer
35 Park Place
Atlantic City, New Jersey 08401

2. Marilyn Savoia's variation:

In planning her graduation party, Marilyn Savoia added two more fields: RESPONSIBILITY and COMMITTEE. She entered the item each guest volunteered to bring in the RESPONSIBILITY field. She had to plan for inputting everything from ICE to MACARONI SALAD, so she allowed 20 characters for each response. The COMMITTEE field was easier. It was either "S" for set up or "C" for clean up.

Sing a Song of Software

THESE PROGRAMS CAN HELP
YOU AND YOUR
COMPUTER MAKE BEAUTIFUL MUSIC
TOGETHER



BY W. PATRICK DICKSON AND MARK GILLINGHAM

Remember memorizing the notes on the scale: Every Good Boy Deserves Fudge? Or how about those piano lessons you resisted like the plague? Or maybe you escaped violin and now regret it. What wouldn't you give to trade places with that life of the party seated at the ivories,

playing old favorites, and livening up an otherwise dreary evening! If you haven't heard yet, thanks to an impressive collection of music-making software, many personal computers can be converted into remarkably versatile and easy-to-use musical instruments.

MUSICMAKING IS A PERFECT COMBINATION OF FUN AND LEARNING.

Computers offer a fun and fascinating way to learn about and play with music. Outfitted with the right kind of software, your computer can provide you and your family with hours of enjoyment as well as a unique way to learn more about music.

Musicmaking, a perfect combination of fun and learning, makes ideal use of the computer. Some programs enable you to play notes and save them. You can go back, erase the bloopers, and fiddle around until you have just the right sound. For music novices there are programs that use graphic displays to illustrate the difference between various pitches, a tough concept for many children and tin ears alike. Still other programs feature on-screen music notation: You enter the notes and they appear in the proper place on a music staff.

THE GENERATION GAP

Until recently, the music capabilities of most personal computers were hidden inside the machines. You could only get at them by programming. Recording or playing a simple melody was truly a programmer's task.

Now there's a host of special software dedicated to making music with your computer. And, as with all software-buying decisions, a number of factors are involved in selecting the right package for your family. First among these is the brand of computer you own. When

it comes to generating music, personal computers are not created equal.

The popular brands fall into one of three different categories. At the head of the class is the Commodore 64 with a built-in music synthesizer and three voices. Several other computers, such as the VIC-20, IBM PCjr, TI-99/4A, and Atari, come equipped with sound generators—multiple voice channels that can come close to making some of the sounds of the Commodore 64. The TRS-80 Models I/III/4 and Timex Sinclair 1000/1500 have limited capabilities and a correspondingly limited amount of music software available.

The Apple II series, the IBM PC, and TRS-80 Color Computer have only one channel for sound. Luckily, several companies make special-purpose "boards" for the Apple and PC that you can slot into the computer to push the sound quality up to par. (Refer to the December 1983 review of Apple music boards in *Apple Orchard* or the December 1983 review of IBM music boards in *PC Magazine*.)

Serious musicians will want three-channel or four-channel sound. But, for beginners and children, a single channel should be perfectly adequate. Keep in mind that even with good software, if you actually want to compose music, it takes more effort to do it with three channels than it does with one.

LEARN BY FIDDLING

Musicmaking software range from programs that play simple melodies that either children or adults can use to more powerful programs for composing and synthesizing. Programs easy enough for younger children to use, in fact, can be enjoyable for adults as well. Typically, they allow you to "play" the computer keyboard and hear sound simultaneously. The experience—a little like fiddling around on a piano—is enhanced by the addition of colorful displays.

"Melody Maker," one of the activities packaged in *Microzine, Vol. 1, No. 2* for Apple, lets you enter songs containing up to 200 notes over a two-octave range. By simply pressing keys, you can enter notes that appear on screen in standard musical notation. A single keystroke alters the type of note (from an eighth to a whole). You can play your song, edit it, then save it to disk. Generate a star-burst or bar-graph display if you wish to enhance your tune. The bar display, in particular, illustrates how pitch varies up and down.

The accompanying manual is one of the best we've seen in terms of the information it provides about music. Although "Melody Maker" is intended for ages 10 and up, we think it could be used by younger children with a little help from older folks.

Music Games, for Apple computers, offers a series of elementary activities that drill beginners in basic music concepts. One game suitable for 5-year-olds asks whether simple melo-

COMPUTER MUSIC TUTORS

In addition to the programs that take a fun approach to music, there are more serious and straightforward ones.

For parents who've pleaded with their children to sit down and practice the piano "just for 20 minutes," the computer might put an end to the incessant coaxing. While there are no shortcuts to mastering such basics as note reading, tempo, scales, keys, and standard chords, the computer can help. Music tutorial programs may motivate students to master a lot of the information required to become an accomplished musician.

The best series of music tutorials we reviewed was the **MECC Music Series**, on disk for the Atari. These thorough programs cover such areas as music terms and notation. In one exercise you listen to tunes or rhythms generated by the computer. Then you have to repeat them note for note or beat for beat. If you answer a question incorrectly, the computer will save it and ask it again later until you get it right. A less extensive version for the Apple, **MECC Music Theory**, covers similar topics. (Versions for the Commodore 64 and Radio Shack TRS-80 Color Computer are scheduled for the fall.)

TRS-80 owners may want to look at the **Music Skills Series**. In these 10 disks you practice note naming, musical terminology, and rhythm, and identify musical symbols. A note of caution: These programs won't hold your kids' attention single-handed. As with any kind of lesson or schoolwork, your encouragement is crucial.

For more information about these music tutorials, contact the manufacturers or distributors.

MECC Music Series, available for Atari Home Computers, 48K (disk): *Music I: Terms and Notations*, *Music II: Rhythm and Pitch*, *Music III: Scales and Chords*; \$46 each.

MECC Music Theory, available for Apple II/II plus/IIe, 48K (disk), \$49. Both from Minnesota Educational Computing Consortium, 3490 Lexington Ave. N., St. Paul, MN 55112; (612) 481-3500.

Music Skills Series, available for the TRS-80 Models I/III/4, 48K (disk): *Basic Skills (I-V)*, \$69-\$89 each, *Rhythm Skills (I-V)*, \$89 from Wenger Corp., 555 Park Drive, Owatonna, MN 55060; (800) 533-0485 ext. 614; in Alaska, Canada, Hawaii, and Minnesota call collect: (507) 451-7871.

dies are going up or down in pitch. Another activity, resembling the popular memory game Simon, asks the child to repeat, note by note, a melody played by the computer. With plenty of help screens, as well as a small but complete manual, this package is enjoyable, educational, and comprehensive. It would be particularly useful for augmenting an elementary school child's music lessons.

Early Games Music, on disk for the Apple, Atari, Commodore, and IBM PC and PCjr, introduces kids to the fundamentals of music through a variety of programs. There are quizzes in which the child must figure out the missing note in a string of notes displayed on the screen. Another activity enables the child to play little melodies and save them to disk (this is not as easy to use as "Melody Maker"). Also entertaining is a section in which colorful graphics accompany the child's creation. Because there is no correlation between the melody played and the display, this doesn't really help to enhance the child's understanding of music, however. Apple owners would do well to consider "Melody Maker" and *Music Games*, whereas *Early Games Music* is the best bet for Atari, IBM, and Commodore owners.

SOPHISTICATED SONGMAKERS

Three music software packages are exceptionally powerful, entertaining, and instructive. Designed for making music, they have advanced features that are not found in other music packages. Although highly motivated or talented younger children (under age 10) might be able to use them, we think these programs are most suitable for teenagers and adults.

Of all the software we've reviewed, **SongWriter**, on disk for the Apple, Atari, Commodore 64, and IBM PC, takes quite a unique approach. You create music by hitting keys—"punching holes"—in the roll of a computerized player piano. As you create or play music, the piano roll moves up or down on the screen. Various options for playing and replaying music are displayed on the screen's borders. Simple keystrokes enable you to play the next note, play the song from the beginning, erase a note, insert a note in the middle of the song, and change the tempo and time signatures. You can save songs on disk and return to them later.

Flexible and easy to use, *SongWriter* provides a rich context for creating music. For example, you can change the key of previously written music or, if you choose, display the names of the notes. The player piano serves as a powerful, concrete metaphor for music. It allows both children and adults to grasp otherwise complicated concepts. The ability to save "musical ideas" (music patterns you create) and put them together into songs encourages you to build up compositions from small parts. In this way, you can experiment with the way

portions of musical pieces affect the whole. Although kids under 10 may need some help mastering the occasionally complicated keyboard commands, *SongWriter* is excellent music software suitable for the entire family.

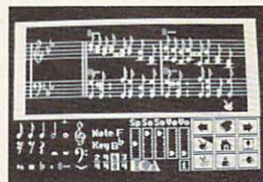
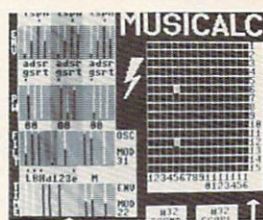
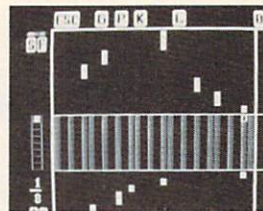
The Commodore 64 is a remarkable music-making machine. But traditionally you needed a lot of programming know-how to bring out its full potential. **MusiCalc**, on disk for the Commodore 64, is an extraordinarily powerful musicmaking shortcut. It lets you play your Commodore 64 like a keyboard instrument with all four rows of keys producing a full range of notes in different octaves. It also turns your Commodore 64 into a high-power, professional-type music synthesizer, with on-screen display of the "sliders" that control the various characteristics of the Commodore 64's three voices.

As you work on your creations you'll learn about musical patterns. Thirty-two preprogrammed tunes which come on the disk, can be played in 32 "sounds"—with different beats and tempos, and emulating a variety of instruments. With *MusiCalc 2* and the *African/Latin Rhythm Template*, which come on additional disks, you can get extra preprogrammed tunes or print out your own creations in standard musical notation.

The fact that it's time-consuming and tough to use (it takes a while to get accustomed to all the complex controls) only reflects *MusiCalc*'s extraordinary power. A full review of all its features would take many times this amount of space. But the bottom line is simply this: If you own a Commodore 64 and are interested in music, *MusiCalc* is a must. It's a program with almost inexhaustible possibilities for making and learning about music.

Music Construction Set, on disk for Apple, Atari, and Commodore 64, approaches musicmaking from an easier angle. To create music you use a joystick or touch tablet to move notes onto a standard music score. If you want to save or edit your piece, or change the tempo or scale, you simply "point" your joystick at one of several "icons," or pictures, located at the bottom of the screen underneath the score. (You'll need the Mockingboard Dual Sound Effects Generator to make the most of the program on your Apple.) Changing your music is a simple "cut and paste" process. Move your pointer over the icons of the scissors and the jar of paste and go to it.

In contrast to *SongWriter* and *MusiCalc*, *Music Construction Set* doesn't turn your microcomputer keyboard into an instrument you can play directly by pressing keys. We found it fun to use, even though it does get somewhat tedious to enter notes with a joystick. The process requires a kind of patience and hand-eye coordination that adults may find unappealing and that young children might have trouble with. But, for teenagers and adults who don't mind tinkering around with the joystick, it has



Above (from top to bottom), *SongWriter*, *MusiCalc*, and *Music Construction Set* are all exceptional software packages that help you harness your computer's music capabilities.

PATRICK DICKSON is an associate professor of Child and Family Studies at the University of Wisconsin and a faculty associate at the Wisconsin Center for Educational Research. He cowrote "Software for Preschoolers" in the November 1983 FAMILY COMPUTING. MARK GILLINGHAM is a graduate student of early childhood education at the University of Wisconsin.

MUSICMAKERS IN BRIEF

Title	Manufacturer Address Telephone	Hardware needed	Program type	Screen display	Docu- mentation	Recom- mendation
EARLY GAMES MUSIC \$29.95	Counterpoint Software 4005 W. 65th St. Shelard Plaza N., Suite 140 Minneapolis, MN 55426 (612) 544-4720	Tested on Apple II/II plus/Ile, 48K (disk). Also available for Atari Home Computers; Commodore 64; IBM PC/PCjr.	Limited music- maker and tutorial	Keyboard, musical staff, kaleidoscope	Limited	Limited ability to save music. Other choices better for children. Apple owners look elsewhere.
FUN WITH MUSIC \$39.95	Epyx Computer Software 1043 Kiel Court Sunnyvale, CA 94089 (408) 745-0700	VIC-20 (cartridge).	Limited musicmaker, arcade game added	Musical staff	Limited	Better VIC-20 software available. Easy enough for very young children.
"MELODY MAKER" \$39.95	Microzine Vol. 1, No. 2 Scholastic Wizware 730 Broadway New York, NY 10003 (212) 505-3000	Apple II/II plus/Ile, 48K (disk).	Limited musicmaker	Musical staff, colorful bar- graphs	Excellent	Good beginning program, best buy for children ages 10 and up.
MULTISOUND SYNTHESIZER \$19.95	Broderbund Software 17 Paul Drive San Rafael, CA 94903 (415) 479-1170	VIC-20 (cassette).	Musicmaker	None	Fair	Most versatile VIC program for playing music on keyboard.
MUSICALC 1 \$49.95	Waveform Corp. 1912 Bonita Bay Berkeley, CA 94704 (415) 841-9866	Commodore 64 (disk).	Complex music synthesizer	Grids, synthesizer controls	Excellent	Best synthesizer available for Commodore 64.
MUSIC CON- STRUCTION SET \$40	Electronic Arts 2755 Campus Drive San Mateo, CA 94403 (415) 571-7171	Tested on Apple II/II plus/Ile, 48K (disk). Also available for Atari Home Computers and Commodore 64.	Musicmaker	Musical staff	Good	Good and powerful, but entering music with joystick may be tedious.
MUSIC GAMES \$29.95	Howard W. Sams & Co. 4300 West 62nd St. Indianapolis, IN 46206 (317) 298-5400	Apple II/II plus/Ile, 48K (disk).	Music games and drill	Keyboard musical staff	Fair	Consider after "Melody Maker." Supplements early music education.
MUSICMAKER \$24.95	Triton Products Co. P.O. Box 8123 San Francisco, CA 94128 (800) 227-6900	T1-99/4A (cartridge).	Musicmaker	Musical staff	Fair	Good for T1 owners.
ORCHESTRA 90 \$79.95	Radio Shack 1800 One Tandy Center Fort Worth, TX 76102 (817) 390-3944	TRS-80 Models I/III/ 4, 16K (cassette). Transfer program to disk.	Musickmaking utility	Sound codes	Very good	Difficult to use but has good sound quality. Amplifier and speaker (or headphones) required.
SONGWRITER \$39.95	Scarborough Systems 25 N. Broadway Tarrytown, NY 10591 (914) 332-4545	Tested on Apple II/II plus/Ile, 48K (disk). Also available for Atari Home Computers; Commodore 64; IBM PC.	Musicmaker	Player piano scroll	Excellent	Excellent for beginners and up.
STUDIO 64 \$39.95	EnTech P.O. Box 185 Sun Valley, CA 91353 (213) 768-6646	Commodore 64 (disk and cassette).	Musicmaker	Musical staff	Poor	Less comprehensive than <i>MusiCalc</i> . Good musical score display.
SYNTH 77 \$27.95 cassette \$30.95 disk	Computerware Box 668 Encinitas, CA 92024 (619) 436-3512	TRS-80 Color Computer (disk and cassette).	Musicmaker	Keyboard with sound controls	Good	Good for CoCo owners.
SYNTH- SOUND 64 \$32.95	HesWare 150 N. Hill Drive Brisbane, CA 94005 (415) 468-4111	Commodore 64 (disk).	Music synthesizer and sound-effects generator	Complex electronic panel	Excellent (technical manual on synthesized sound)	Primarily for technically- oriented user.
VIC MUSIC COMPOSER \$39.95	Thorn EMI Computer Software, Inc. 3187 C Airway Ave. Costa Mesa, CA 90210 (714) 751-3778	VIC-20, 5K (cartridge).	Musicmaker	Music score	Poor	Use joysticks to enter notes. Not as easy as <i>MultiSound Synthesizer</i> .
VIRTUOSO \$6.95	William D. Maples 688 Moore St. Lakewood, CO 80215	TS 1000/1500 (cassette).	Musicmaker	None	Poor	Difficult note- entering process, but one of few music programs for TS 1000/ 1500.
WHEN I'M 64 \$29.95	Alien Group 27 W. 23rd St. New York, NY 10010 (212) 741-1770	Commodore 64 (disk or cassette).	Musicmaker	Singing head	Good	Take a look—an interesting novelty item.

an enormous amount to offer in terms of enjoyment and learning about musical notation and concepts.

OTHER MUSICMAKERS

Besides these three highly recommended music software packages, a number of other programs we reviewed deserve mention.

Not a great deal of musicmaking software exists for either the TI-99/4, the TRS-80 Models I/III/4, or the Color Computer. Of the programs we encountered for the TI, **Music Maker** stands out. It allows you to compose music two ways. Using the arrow keys, either pick up notes and move them onto a standard music score, or try the less time-consuming method of drawing a line that traces the music's pitch. If the lines go up, the music gets higher. You can use three different kinds of voices and save your work.

Synther 77 lets TRS-80 Color Computer owners take advantage of their machine's fine music capabilities in an easy-to-use synthesizer program. A complete list of features enable you to simulate different instruments by altering characteristics of each sound and changing key and pitch. A reasonably clear screen layout and thorough documentation help to simplify an otherwise complex program.

Orchestra 90 is a music synthesizer for composing music on the TRS-80 Models I/III/4. To get sound you'll need to hook up a stereo amplifier. Though difficult to use, its six-octave, three-, four-, or five-voice range is quite good. As in all software purchases, the same rule applies: If you can, try this program in the store before you buy it to make sure it's something you want to spend the time trying to master.

VIC-20 owners have a number of strong packages to choose from. Of these, **Multi-Sound Synthesizer** is the most versatile and the best VIC value. It lets you compose and save works of up to 255 notes in length. You can "play" the top two rows of your VIC keyboard, sounding notes in one of five octaves. Flavor your creations with a percussion background for a musical style like the waltz or tango. Other assorted noises and sounds can also be included. The one shortcoming of this easy-to-use program is its lack of on-screen display.

Other noteworthy programs for the VIC include **VIC Music Composer**, in which you manipulate notes and place them on the on-screen score, and **Fun With Music**, in which you play the number keys as if they were on an organ keyboard. The **VIC Music Composer** takes full advantage of the computer's three voices. You can vary scales and tempos, and save and rework your creations. Although not as versatile as **Music Composer**, **Fun With Music** is much easier to use. Both programs provide stimulating opportunities to learn about music.

(Editor's Note: Although not in the same league as any of the other programs men-

tioned here, **Virtuoso** is an admirable attempt at bringing music within the grasp of Timex Sinclair 1000/1500 owners. Entering notes is a lengthy process. Confusing documentation does not make using the program any easier. But, we do think this is about the best Timex Sinclair owners will do in the commercially available music software department.)

Two additional programs for the Commodore 64 also deserve mention. **Synthesound 64** is a complex, technical program that would be useful for someone working in advanced synthesized music. Creating, saving, and revising compositions is a complicated process, but one that can teach hardier souls a great deal about the technical details of Commodore 64 sound. **Studio 64** is a simpler package that turns the computer into a keyboard instrument. You can vary the sound of the music so that it resembles different instruments such as a violin or organ. Though it's a solid program, **Studio 64**'s scanty documentation provides little more than the bare necessities for operating the program.

Perhaps the most unusual program we saw was **When I'm 64** (Commodore 64), in which an animated "talking head" sings along with preprogrammed music (one selection of which may be inappropriate for young listeners). Equipped with the Voice Box (\$129 from the same company), your little fellow can sing preprogrammed words or ones you type in phonetically yourself. Create faces or shapes of any sort and adjust them to move in time with songs you've composed. In a class by itself, this music program may even draw some attention away from that piano-playing life of the party.

SOUR NOTES

We looked at more than 40 commercially available pieces of musicmaking software. While many were high quality and would make a decent addition to your software library, an almost equal number are not recommended for the home user.

For one thing, packages may sound appealing and relatively straightforward, but they frequently involve complicated note entry. Perhaps the melody saving is clumsy or the program lacks the important ability to save anything.

Commodore's **Music Machine**, for instance, may have represented a breakthrough once, but now it's obsolete. You can vary the sound's voice, octave, and other characteristics, but you can't save or edit your efforts.

In the past year or two, music software's come a long way and it's getting better and better. It won't ever replace the faithful old family upright, but powered with friendlier, more inviting, and more versatile music software, the computer is a great alternative to those infernal piano lessons. It can add exciting new dimensions to musicmaking in your home. **FC**



MUSIC SOFTWARE WON'T REPLACE THE FAITHFUL OLD FAMILY UPRIGHT.

Taking it on the Road

A PERSONAL GUIDE TO TRAVELING WITH A MICRO

BY STEVEN S. ROSS

My wife and I depend on computers for our livelihood as well as for continuing education—and our three daughters are always discovering new uses for one of the four computers in the house. We also travel constantly. In 1983 I logged about 80,000 miles in business-related air travel alone.

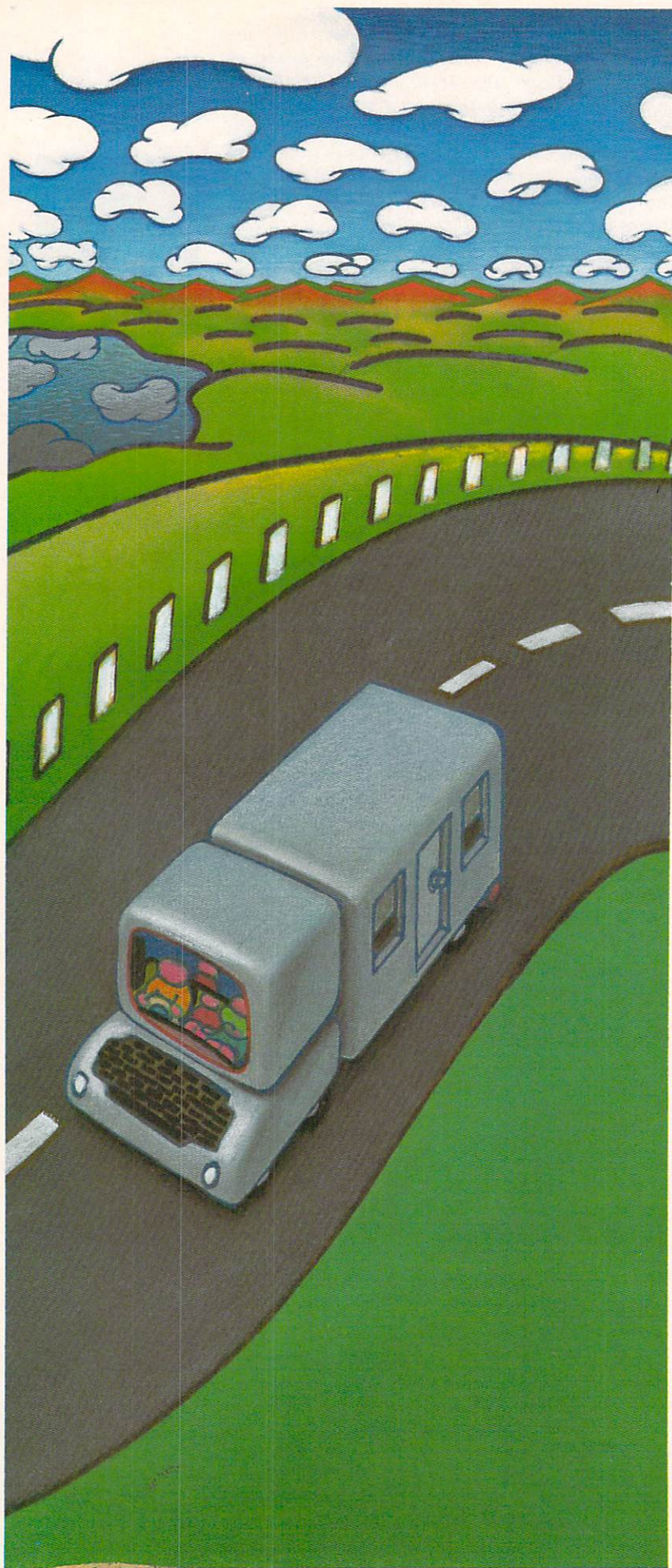
From last September to this past February, for instance, our family lived in Hawaii while my wife took advantage of a fellowship in international marketing as part of her work towards an MBA degree. The program also included an internship in Tokyo, and the five of us flew there in March to help her settle in. During those months, I returned to our permanent home in New Jersey four times, always with disks and twice with my bulky Kaypro.

We've had to learn how to transport computers safely and how to use them on the road. If you're thinking of traveling with a computer, you can learn from our experience.

PAY ATTENTION TO DETAILS

The secret of keeping your micro happy on the road is careful attention to detail. Computers and peripherals are designed to be pretty tough. But care and common sense will lengthen the odds even more in your favor.

The most important rule of all is: Never throw out your original packing material . . . ever! Those strangely convoluted bits of foamed plastic, made to nest snugly inside custom-size corrugated cardboard boxes, are your best guarantee of trouble-free handling by airlines, package express services, or the U.S. Postal Service. Don't worry if you broke some of the



ILLUSTRATIONS BY HARTON STABLER

plastic widgets in your haste to get your new computer out of the box in the first place. Even broken pieces work fine.

When I transport my computer by car, I usually put it on a seat rather than in the trunk. Seat cushions absorb some shock and most vehicles are designed to absorb more road movement in the passenger compartment than in the luggage compartment. If the car is full I rest my computer on a soft, down-filled winter coat in the trunk.

DISK-DRIVE DEFENSIVELY

While some people believe the most delicate part of a computer system is the monitor, most monitors are pretty sturdy. It is your disk drives, in fact, that need some special attention. Their light, finely-tuned mechanisms can pick up travel vibrations great enough to cause damage.

If your drive came with a cardboard insert, use it whenever you take the computer anywhere farther than the house next door.

If you've already lost the insert, or never got one, you can use an old, worn floppy disk instead—one you no longer store files on.

Once the insert or old disk is inside the drive, shut the door tightly. Don't bother with tape; the latches are very sound. If your drive is jostled enough for the door to open, chances are the inner mechanisms will be destroyed anyway.

PRINTERS: GETTING YOUR HEAD TOGETHER

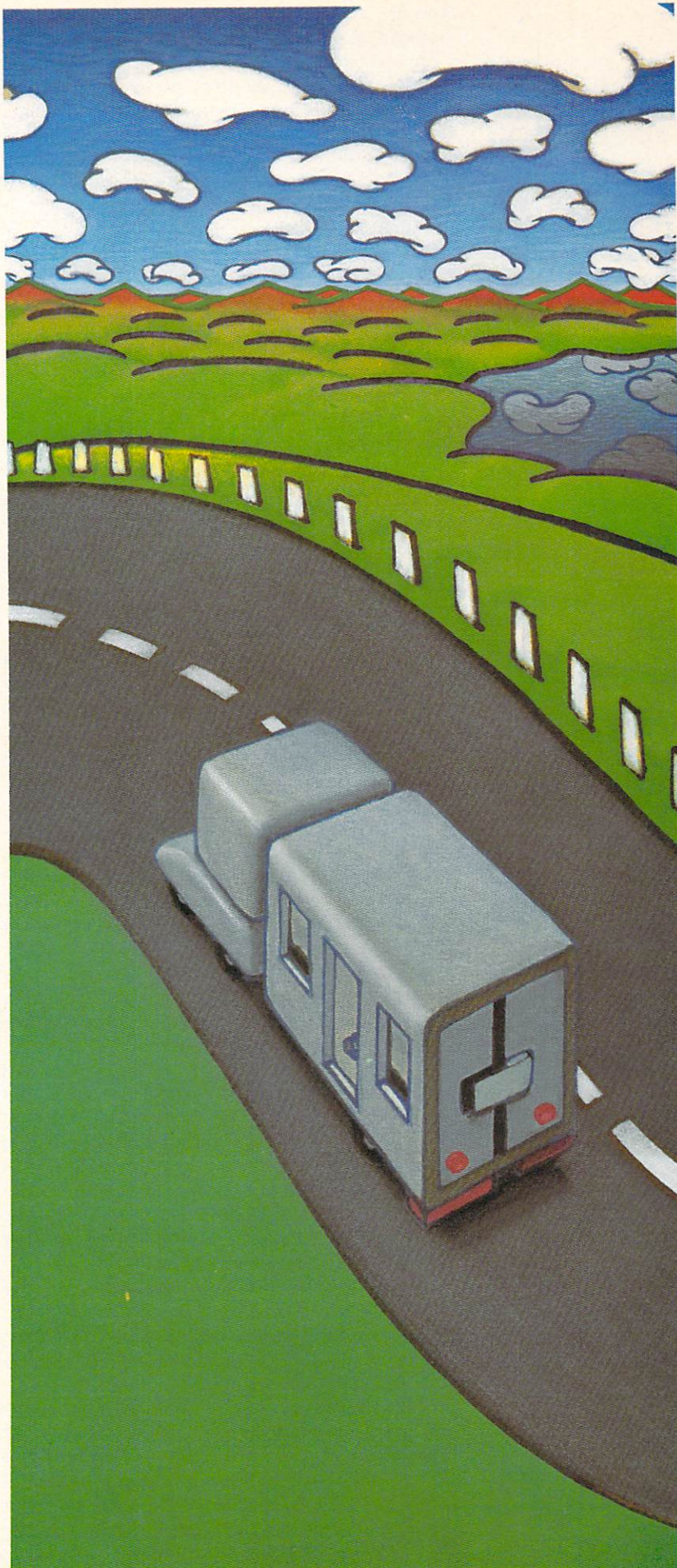
Most printers have print heads—dot matrix or daisy wheel—which move freely along a smooth track. Unless that movement is restrained for travel, the head will slide back and forth from one end of the track to the other. You must keep it from moving, but don't use tape. Any small amount of sticky residue on the track can keep it from working properly.

The printer's original packing probably included a long, thin piece of plastic that fit over the track and confined the head to one side of the printer. Or, perhaps there was a foamed plastic insert that wedged the head up against the printer cover. If you no longer have the original protective device, use wads of newspaper or cut a paper-towel roller to the proper length, with a slit to fit over the track the head runs on.

I've found that cotton socks and undershirts work well too, as long as one keeps them from snagging the cords that move the head when the printer is in operation. (I suspect that wool socks are too full of lint and broken fibers for this, but I've never seen a technical paper on the subject.)

MODEMS: FIND A PHONE

Hotels and motels are generally not designed for the traveling computer user. Their phones, for instance, are almost always hard-wired into the wall. That protects the establish-



**AT A MOTEL IN
DOTHAN,
ALABAMA, I
TURNED ON MY
COMPUTER AND
DESTROYED TV
RECEPTION FOR
ALL ITS 40
ROOMS!**

STEVE ROSS, who lives in Leonia, New Jersey, is a writer, teacher, and consultant. Among his nine technical books is *Product Safety and Liability: A Desk Reference*, coauthored with the late John Kolb, and published by McGraw-Hill.

ment, and makes it tough for guests who might steal the equipment. But it also makes it impossible to use a direct-connect modem, which requires a modular phone cord. Once I was pleasantly surprised to find a modular jack in a room—but then the phone system in the hotel wouldn't transmit the modem's signals.

You won't have to deal with these problems if you're using a common, acoustic-coupler modem—the kind with rubber cups that fit over a phone receiver. They're only good for transmitting at the 300-baud rate, however.

**INTERFERENCE:
PEACEFUL COEXISTENCE**

It wasn't until late 1983 that the Federal Communications Commission regulated the radio frequency (RF) signals a business computer could generate. My Kaypro happens to be an early model that does not meet those government standards for interference with television sets. It is guaranteed to ruin the reception of any TV within about 20 feet, unless the TV gets its signals through a well-installed coaxial cable. (Coax cables are usually round, in contrast to the conventional flat, "twinlead" antenna hookups).

In Dothan, Alabama, I was happy to see just such a well-installed coaxial cable running to the back of my motel room's TV. I turned on the computer—and destroyed reception for all the motel's 40 rooms. My room turned out to be right next to the master antenna for the whole motel!

This is a similar issue to that of computers aboard airplanes, which have radio communications that simply must not be messed with. I sympathize with airline crews that insist their passengers not use portable computers in flight. My Kaypro, for instance, looks exactly like newer models that don't cause much interference. But if I attempted to use it with a battery pack, I would almost certainly confuse the aircraft's navigational system and radar.

It all comes down to the RF signal emitted from the microprocessor (CPU), which might cause interference. The Federal Aviation Administration (FAA) specifically bans the use of electronic equipment that might interfere with in-flight communication, navigation, and flight-control instruments.

The newer lap computers have no circuitry inside them that might cause such interference, as long as they are not connected to a printer. They only have a few batteries and a liquid-crystal display—the same sort of items that are in watches, calculators, and tape recorders (which are all allowed on aircraft).

In the past several months, however, many airlines have made blanket rulings against the use of computers during flight—they're afraid of possible interference, and perhaps don't have the time to make computer-by-computer judgments about which are and which aren't safe. American Airlines, for instance, prohibits the use of any computers during their flights.

DON'T LEAVE HOME WITHOUT IT?

The kids want to take the computer along on the family vacation? You're skeptical. But you might be convinced if someone can give you a practical reason to do it?

Here are six ideas. With a little bit of effort, you really can enhance your vacation electronically.

1. PLAN YOUR TRIP . . .

A program called *Roadsearch* can develop a route for you, based on information about 406 cities and 70,000 miles of major highways. You can use it to estimate the shortest route, eliminate roads you know charge tolls, compute your mileage, and estimate how long the trip will take at various speeds. *Roadsearch* isn't a replacement for maps, but it can be a quick, bright assistant in making—and changing—route decisions. For Apple II/IIe and Commodore 64 computers (disk), \$34.95, from Columbia Software.

2. BUDGET YOUR TRIP . . .

A simple home financial planning package or a spreadsheet such as *Home-Calc* can be used to plan your expenses and help you develop a budget for your trip. Use different "cells" of the spreadsheet to set up daily expense columns for food, entertainment, gifts, gas and tolls, etc., and then compare your budget with your actual expenses each night. *Home-Calc* is available for Atari Home Computers, 24K (disk) and 16K (cassette), \$39.95 and Commodore 64 (disk and cassette), \$34.95; from SIM Computer Products. Versions planned for Apple and IBM computers.

3. KEEP AN ELECTRONIC DIARY . . .

Many families have found that keeping a written record of a trip enhances it in memory. Now that word processing makes writ-

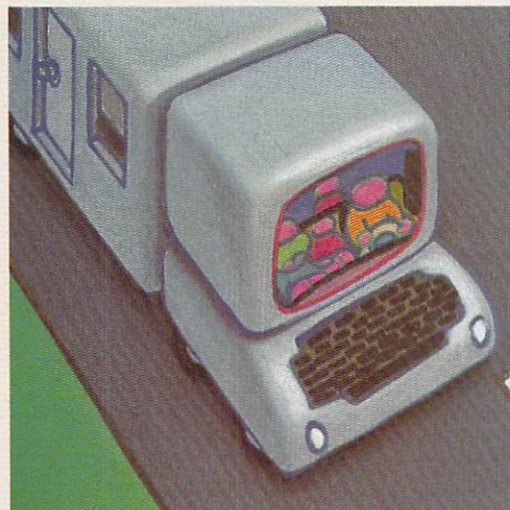
United Airlines, on the other hand, won't allow passengers to use such items as AM/FM radios and remote-control toys, but does permit the operation of "typewriter-style portable computers." It's best to check the individual airline's policy when you're making a reservation. Be prepared to specify the model of your computer and whether or not you'll be using a printer.

Just as some computers cause interference and some don't, certain airport security checks cause trouble while others are harmless. In general, X-ray machines will not harm your disks, since they have no detectable magnetic

ing easier for children, they often write more. Ask the kids to write their impressions each night—what they saw and how they felt about it. (You can do it, too.) Then, when you get home, print out the pages, leaving space for postcards, photographs, and the like. Bind the results in cardboard, and you'll have a "book" of your journey.

4. MEET YOUR COMPUSERVE/SOURCE FRIENDS . . .

If you're on one of the electronic networks, now might be an opportunity to visit some of the people you've been interacting with. Let them know via electronic mail that you'll be in their area, and will be getting in touch. (Steve Roberts, profiled in an upcoming issue, has been doing just that.)



5. CREATE AN ADVENTURE GAME . . .

"What if we go to the lake tomorrow? What might happen there? What if we go to the fair instead?" A vacation is an adventure, every bit as exciting as *Dungeons & Dragons*, and much more real. Now there's software you can use with your children to create an adventure game based on your trip. Each night you imagine what might happen the next day. As you travel, you add new alternatives based on what you've seen.

Here are three programs to help you and your kids do this. For children ages 7 and up, *That's My Story* by Learning Well, available for Apple II/II plus/IIe, 48K (disk),

\$59.95. For children 12 and up, *Adventure Creator* by Spinnaker, available for Atari Home Computers and Commodore 64 (cartridge), \$39.95 or *Story Tree* by Scholastic Wizware, available for Apple II w/Applesoft ROM/II plus/IIe, 48K (disk), \$39.95.

6. LEARN STUFF . . .

If it's important to you that your children don't stop learning while they're on vacation, try interactive computerized educational games. Your children might be more receptive to them than they would be to traditional schoolwork. Vacations are supposed to be fun—so is much learning software, which may fit into the vacation "mood" better than textbooks would.

There's a whole batch of travel-oriented learning software for kids. Here are a few examples: *States and Capitals* by Timex, for the Timex Sinclair 1000/1500 (cassette), \$5.95 and the TS 2068 (cassette), \$7.95 (cartridge), \$14.95; *Agent U.S.A.* by Scholastic Wizware, for Atari Home Computers, 48K (disk), \$29.95; with versions planned for Apple II plus/IIe; Commodore 64; and IBM PCjr; and *Trains* by Spinnaker, for the Apple II/II plus/IIe, 48K (disk); Atari Home Computers, 48K (disk); Commodore 64 (disk); and IBM PC/PCjr (disk), \$39.95.

If bringing the computer along just doesn't make sense for you, maybe you can include a computer stop on your vacation. Here are a few possibilities.

In the Boston area, you can visit The Computer Museum, the world's only museum dedicated to preserving the history of computing. Information: (617) 426-7190.

"Chips & Changes," a traveling computer exhibition, is at the Oregon Museum of Science and Industry in Portland, Oregon, through August 5. Information: (503) 222-2828. On August 25, it opens at The Science Place in Dallas, Texas. Information: (214) 428-8351. FAMILY COMPUTING is a cosponsor of "Chips & Changes."

If you're in Washington, D.C., consider visiting The Capitol Children's Museum, which has a roomful of computers specifically redesigned to be easily used by children. Information: (202) 543-8600. —BILL CAMARDA

**NOW THERE'S
SOFTWARE YOUR
FAMILY CAN USE
TO CREATE AN
ADVENTURE
GAME BASED ON
YOUR TRIP.**

field, but walk-through machines might. Walk-through machines do generate magnetic fields that could destroy or erase the data stored on a disk. While these magnetic fields are usually less than 1/10 of the intensity that would harm your data, you should play it safe and ask for a hand inspection of your disks.

ELECTRICITY: GETTING THE RIGHT KIND

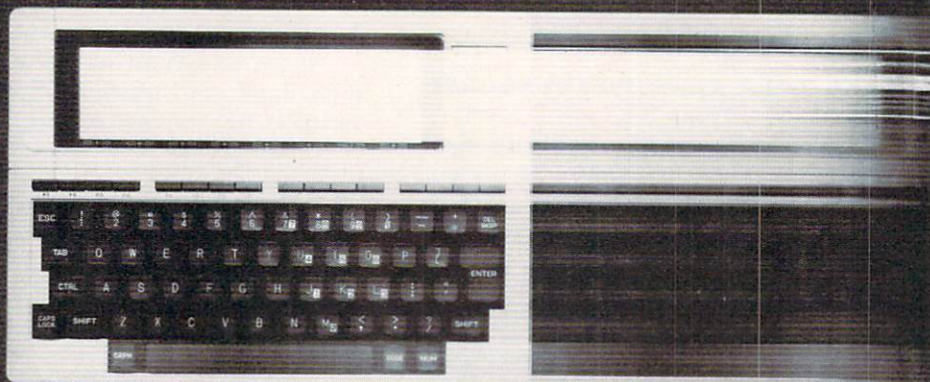
If you travel abroad with a portable computer or any other device that runs on batteries, don't depend on rechargeables to keep your

equipment going. Even small voltage differences may make it impossible to recharge the batteries. I travel with every voltage adapter known to humankind. For my tape recorders and computer, I invest in disposable alkaline batteries. They last longer than rechargeables, but, of course, you have to install an entirely new set when they wear down.

I'm not saying you should pack up your computer and carry it across the country on the merest whim, but if you've got a good reason to take your computer along, it can be done safely and productively. ☐

BUYER'S GUIDE TO PORTABLE COMPUTERS

HAVE COMPUTER,
WILL TRAVEL?
BESIDES GETTING
MORE POWERFUL,
COMPUTERS ARE
GETTING LIGHTER
AND SMALLER.



TRS-80 Model 100

In 1983, the shining star of the computer universe was Radio Shack's TRS-80 MODEL 100. It's a powerful little computer that runs on batteries, and fits in a briefcase. The 4-pound computer is known as a portable.

The big splash of 1984, so far at least, is Apple's MACINTOSH. The computer has been touted as the first of a new generation of computer friendliness that will revolutionize the way technology puts pictures, words, and numbers before our eyes. Is it any surprise that this fun-loving computer also comes with a handle and a carrying case (\$99) that slings over the shoulder? The 20-pound Macintosh is portable.

Like many other consumer products, computers are miniaturizing at a rapid rate. What yesterday may have taken a full desk to hold can now literally fit into a knapsack. What used to weigh more than a bag of bowling balls (and looked like an Army surplus suitcase) now weighs less than a fat cat.

Everyone, it seems, is coming out with sleek and attractive portable computers. Commodore has a portable version of the popular Commodore 64, the COMMODORE SX-64. IBM has a portable version of its popular IBM PC, the IBM PORTABLE PC. Kaypro, the reigning king of the portable market, has three models out and keeps improving them all the time. By the end of 1983, 100 portables from 70 manufacturers were on the market, with more on the way.

WHAT'S THE BIG FUSS?

Are these moveable machines useful, or is portability some kind of marketing gimmick? The answer is: a little bit of both. How useful these computers are depends on your own needs, the type of machine, and, in some cases, the condition of your back. Portability is certainly a better feature than fins on 1950s cars. But one could also argue that some manufacturers just add a handle to a computer and call it "portable."

A 27-pound computer, after all, is not something you carry around for a lark. A 4-pound portable is more suited to that, but it might not always do what you want. There are some computers, such as the new APPLE IIC and the SHARP 5000, that fall in between. They are more powerful and heavier than the briefcase portables, and lighter and less powerful than the transportables. In short, there are three main categories, and each has advantages and disadvantages.

Let's look at the main features of transportables, portables, and hybrids, highlight the major brands in each

category, and compare them to more traditional desktop computers. For complete specifications on portables and transportables, see the two charts.

TRANSPORTABLES

Transportables are desktop computers that can be folded up into one unit and carried around. Because they generally weigh between 15 and 30 pounds, transportables are not made to be carried to and from work on a daily basis. But they can be easily moved around the house or packed in the car for a weekend.

These "luggables" come with a built-in monitor and one or two built-in disk drives. Standard user-memory space ranges from 64K to 128K, with possible upgrades to 256K or more. Unlike portables, which can run on batteries, transportables require an AC outlet. Often, several pieces of business software are included with the purchase price. That, of course, is a tipoff: Transportables are first and foremost business machines.

Screen Display. The monitors on transportables are almost always monochrome (one-color). The exception to this is the COMMODORE SX-64, which has a color display and will run all the games written for the Commodore 64. These monitors are smaller than conventional stand-alone monitors, with displays ranging from 4-inch (measured diagonally) to 9-inch. Most users find these screens big enough, since the print is no smaller than one would read in a book, and the screen holds enough characters to be suitable for word processing and other text-intensive applications. In many cases, the computer can be connected to a larger, external monitor. On the MACINTOSH, the resolution is so sharp and clear that it makes up for the 9-inch screen.

Disk Drives. New and improved methods of mass storage have spurred the rise of portable computers. Standard 5¼-inch disk drives have been compressed in some models, such as the TRS-80 4P, so that they take up a fraction of the space they do in desktop models. Most transportables either come with, or have room for, two disk drives. One exception is the MACINTOSH, which has only one drive. It is an exceptional 3½-inch drive, however, that stores more (400K) than most 5¼-inch drives.

Software. Some people buy transportables because of the software, which often comes "bundled" with the computer. The software includes word-processing, spreadsheet, data-base, and other types of business programs. The cost of such software, purchased separately, often

exceeds that of the computer itself. (The software sold with each machine is listed in the chart.) Some dealers could justifiably advertise: "Buy this software, and I'll throw in the computer for free."

IBM Compatibles. There are so many so-called IBM-compatible transportable computers that they almost make up a separate category. These computers, which use the MS-DOS operating system, run most or all software written for the IBM PC, which gives them a large software base. Even Kaypro, which has long relied on the CP/M operating system, has upgraded its Kaypro 4 to a KAYPRO 4+88, which runs IBM software.

Now that IBM has brought out its IBM PORTABLE PC, manufacturers of compatibles will face stiffer competition. But they generally still offer some features that IBM doesn't. The PANASONIC SR. PARTNER has a built-in thermal printer—paper comes out the top of the monitor! The MINDSET, one of the newest entries, has superb high-resolution color graphics—the best in the business. The SEEQUA CHAMELEON is sold with *Perfect Calc* and *Perfect Writer*, and will run CP/M software as well as IBM's. The COLUMBIA, CORONA, and EAGLE PC also come with bundled software. And these compatibles generally cost less than the IBM PORTABLE.



IBM's Portable
Personal Computer

PORTABLES

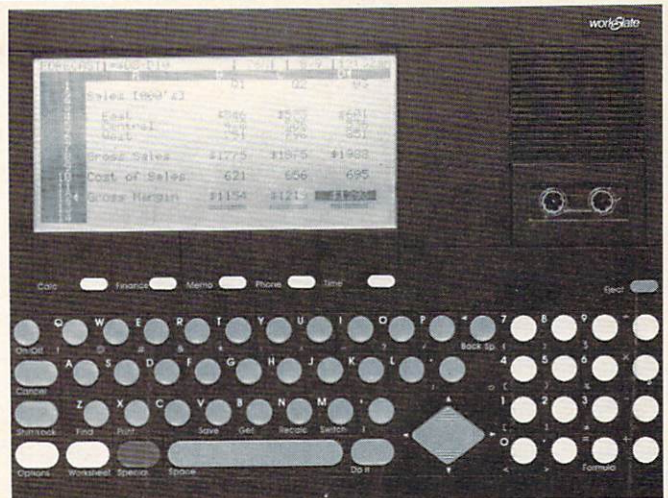
True portable computers are also referred to as notebook, briefcase, or lap computers because of their convenient size. Most of these portables operate on batteries that last from 2 to 10 hours without recharging or replacement. They can do this because they use CMOS microprocessors, which require very little power.

Screen Display. Most portables use LCD (liquid crystal display) screens. LCD's need available light in order to be read and they cannot display characters as quickly as the conventional CRT screens (cathode-ray tubes) used in most monitors. Since LCD screens do not emit light, you must have a good light source at all times. Some very expensive portables use a new type of screen, called ELD (electroluminescent display), which emits light. But ELDs are expensive and power-draining, and still very rare.

Because portables can fit in briefcases, their screens are relatively small. Text is displayed in 4 to 16 lines, ranging in length from 20 to 80 characters.

Memory/Storage. The memory capacity on portables is limited. The TRS-80 MODEL 100, for instance, comes with 8K as standard and can only be expanded to 32K. The NEC PC-8201 comes with 16K, expandable to 64K. However, there's more here than meets the eye. Memory in most portables is a "non-volatile" RAM. This means that the contents of RAM remain live even when the machine is turned off. When it's turned on again, your data is still there.

And, while disk drives are not part of the standard portable system, you can usually add them. You can also



Convergent Technologies' WorkSlate

store data on cassette recorders. Some portables, such as Convergent Technologies' WORKSLATE and the EPSON HX-20, have a microcassette recorder built in. The Epson also has a built-in dot-matrix printer, an unusual feature in such a small computer.

Software. While portables often come with "bundled" software, portables often come with built-in software. The standard is BASIC and a word-processing program of some sort. Portables with built-in modems—the TRS-80 MODEL 100 and WORKSLATE—include telecommunications software. So does the NEC-8201, which does not have a built-in modem but sells an external one. The WORKSLATE, which is primarily a number-crunching computer, has a built-in spreadsheet program. Other typical built-in programs are schedule managers, address managers, and file managers.

ADVANTAGES AND DISADVANTAGES OF PORTABLES AND TRANSPORTABLES

PORTABLES TRANSPORTABLES

MEMORY

8K to 256K 64K TO 640K

WEIGHT

3–11 pounds 15–30 pounds

GENERAL FEATURES

Built-in software: often built-in modem.	Come with "bundled" software, usually word processing and spreadsheet. Include one, and sometimes two, built-in disk drives and a built-in monitor. Printer and modem ports standard. Self-contained system with handle for carrying.
Battery operated.	
Very small and light. Printer port built in. Usually connect to disk drives. Sometimes feature built-in cassette recorder.	

DISADVANTAGES

Limited memory.	Smaller screen displays than desktops. Usually no color capabilities. Too heavy to carry around on regular basis.
Small screen displays.	
"Eat" batteries. Operate more slowly than desktops.	

ADVANTAGES

Will fit in a briefcase.	Usually compatible with popular desktops; thus have large software base. Usually less expensive than comparable desktops.
Very easy to use on a train or on the couch.	
Built-in software is very efficient and well-written.	

LEADING PORTABLE COMPUTERS

TRANSPORTABLES

Model	Manufacturer	Price	Dimensions (inches)	Weight (lbs.)	Power Supply	Display Size (diagonal)	Text Display (# Characters)	Keyboard/# Keys
APRICOT	ACT North America 3375 Scott Blvd., Suite 336 Santa Clara, CA 95051 (408) 727-8090	\$3,190	16.5" x 12.5" x 4"	26	AC only	9"	80 x 25	Full/90
MACINTOSH	Apple Computer Inc. 20525 Mariani Ave. Cupertino, CA 95014 (408) 996-1010	\$2,495	13.2" x 10.5" x 9.3"	20	AC only	9"	40 to 132 (varies with font size)	Full/58
COLUMBIA MPC-VP	Columbia Data Products 915D Rumsey Road Columbia, MD 21045 (800) 638-7866	\$2,945	18" x 16" x 8"	32	AC only	9"	80 x 25	Full/83
EXECUTIVE SX-64	Commodore Business Machines 1200 Wilson Drive West Chester, PA 19380 (215) 431-9100	\$ 995	14.5" x 5" x 14.5"	27.6	AC only	5"	40 x 25	Full/66
CORONA PPC11	Corona Data Systems 275 E. Hillcrest Drive Thousand Oaks, CA 91360 (800) 621-6746	\$2,545	19.8" x 18.8" x 9.6"	28	AC only	9"	80 x 25	Full/83
PORTABLE COMPUTER	Compaq Computer Corp. 20333 FM 149 Houston, TX 77070 (800) 231-9966	\$2,695	20" x 8.5" x 16"	28	AC only	9"	80 x 25	Full/103
PORTABLE PERSONAL COMPUTER	IBM P.O. Box 2989 Delray Beach, FL 33444 (305) 241-7614	\$2,795	20" x 17" x 8"	30	AC only	9"	80 x 25	Full/83
KAYPRO II	Kaypro Corp. 533 Stevens Ave. Solana Beach, CA 92075 (619) 481-4300	\$1,295	18.8" x 16.3" x 8.5"	26	AC only	9"	80 x 24	Full/76
ATTACHE	Otrona 4725 Walnut St. Boulder, CO 80301 (800) 525-7550	\$2,695	12" x 13.6" x 5.75"	16	Battery optional/AC optional	5.25"	80 x 24	Full/63
RLH-7000 SR. PARTNER	Panasonic Industrial Co. 1 Panasonic Way Secaucus, NJ 07094 (201) 348-7292	\$2,495	18.5" x 13.25" x 8.25"	29	AC only	9"	80 x 25	Full/83
CHAMELEON	Seequa 8305 Telegraph Road Odenton, MD 20003 (301) 672-3600	\$1,995	18" x 15.5" x 8"	28	AC/DC optional	9"	80 x 25	Full/72

PORTABLES

IIc	Apple Computer Inc. 20525 Mariani Ave. Cupertino, CA 95014 (408) 996-1010	\$1,295	12" x 11.5" x 2"	7.5	AC/Battery optional	Varies	80 x 24	Full/62
WORKSLATE	Convergent Technologies 2441 Mission College Blvd. Santa Clara, CA 95050 (408) 980-9222	\$1,195	8.5" x 11" x .75"	3	Battery standard/AC adapter included	6" x 3"	46 x 16	Round Chiclet-style keys (3/4 size), one SHIFT key/58
HX-20 NOTEBOOK COMPUTER	Epson America, Inc. 3415 Kashiwa St. Torrance, CA 90505 (800) 421-5426	\$795	11.4" x 8.5" x 1.75"	4	Rechargeable battery pack	3.5" x 1"	20 x 4	Full/68
THE PORTABLE	Hewlett-Packard 3000 Hanover St. Palo Alto, CA 94304 (415) 857-1501	\$2,995	13" x 10" x 3"	9	Rechargeable battery pack	NA	80 x 16	Full/75
PC-8201	NEC Home Electronics, Inc. 700 Nicholas Blvd. Elk Grove Village, IL 60007 (312) 228-5900	\$500	11.5" x 8.25" x 2"	3.8	Rechargeable battery pack/AC optional	2.25" x 7.75"	40 x 8	Full/67
MODEL 100	Radio Shack 1800 One Tandy Center Fort Worth, TX 76102 (817) 390-3944	\$799	11.75" x 8.5" x 2"	4	Battery standard/AC adapter optional	7.5" x 2.25"	40 x 8	Full/72
PC-5000	Sharp Electronics Corp. 10 Sharp Plaza Paramus, NJ 07652 (201) 265-5600	\$1,995	12.75" x 12" x 3.5"	9.74	Rechargeable battery pack/AC adapter included	9.3" x 1.3"	80 x 8	Full/72

RAM Standard/ Maximum	Mass Storage	Included Software	Comments
256K/ 768K	Two 315K disk drives or two 720K disk drives	<i>The Manager</i> , <i>SuperCalc</i> , <i>SuperPlanner</i> , BASIC (MS and Personal)	MS-DOS and CP/M; LCD screen
128K	One 400K disk drive (3.5")	<i>MacPaint</i> , <i>MacWrite</i>	Mouse included; can replicate human voice; very easy to use
128K/ 256K	Two 320K disk drives (360K with DOS 2.0)	MS-DOS, <i>Perfect</i> series, <i>Home</i> <i>Accountant</i> , BASIC, CP/M-86	IBM compatible
64K	One 170K disk drive	CP/M, BASIC	Compatible with all Commodore 64 software; monitor is color
128K/ 512K	One 128K disk drive	MS-DOS, <i>Multi- Mate</i> , <i>PC Tutor</i> , BASIC	IBM compatible; optional second drive
128K/ 640K	One 320K disk drive	BASIC	IBM compatible; optional second disk drive
256K/ 512K	One 360K slimline disk drive	DOS 2.1	Color graphics monitor adapter available; five expansion slots
64K	Two 191K disk drives	<i>WordStar</i> , <i>Word</i> <i>Plus</i> , <i>Perfect</i> <i>Calc</i> , CP/M 2.2, BASIC	Kaypro 4 (\$2,495) has built-in modem, IBM compatibility; Kaypro 10 (\$2,795) has hard disk
64K/256K	One 360K disk drive	CPM, <i>WordStar</i> <i>Plus</i> , <i>Multiplan</i>	Double disk drive model (\$2,995) weighs 3 lbs. more; hard disk model (\$3,795)
128K/ 512K	One 360K disk drive	MS-DOS, <i>VisiCalc</i> , <i>WordStar</i> , <i>PFS</i> , <i>File and Report</i>	IBM compatible; built-in thermal printer
128K/ 256K	One 320K disk drive	MS-DOS, MBASIC, <i>Perfect</i> <i>Calc</i> , <i>Perfect</i> <i>Writer</i> , <i>WordStar</i> , <i>SuperCalc 3</i>	IBM and CP/M-80 compatible
128K	One 143K drive	BASIC ProDOS	Second drive optional; "flat panel display" in development
16K/32K	Microcassette built in	Spreadsheet and appointment templates	Built-in modem; optional multicolor microprinter; other accessories
16K/64K	Microcassette built in	BASIC, <i>SkiWriter</i>	Built-in 2 1/4" dot- matrix printer; 32K ROM expands to 64K
272K	Optional 710K 3 1/2-inch disk drive (\$795).	<i>PAM</i> , <i>Lotus 1-2-3</i> , <i>MemoMaker</i> , <i>Terminal</i> <i>Emulation</i>	IBM compatible; built-in modem; battery operated ink- jet printer (\$495) optional.
16K/64K	Optional CMOS cartridges	Calculator, text formatter, appointment, scheduler, terminal selector	Monitor interface under development; battery-powered modem (\$80) optional
8K/32K	Cassette/disk drive optional	<i>Text</i> , <i>Telcom</i> , <i>Address</i> , <i>Schedule</i> , BASIC	Disk drive and monitor interface cost \$799; built-in modem
128K/ 256K	Cartridge/ cassette or 320K dual-disk drive optional	<i>SuperWriter</i> , <i>SuperComm</i>	Built-in dot-matrix printer optional

This software is often very compact and efficient, making up for the relatively small memory space. On the TRS-80 MODEL 100, for instance, the word-processing program takes up only 2.5K. So, you still have a lot of room left over for other programs and files.

Modems. It is possible to buy commercial software for portables, but it's not something you should count on. There's just not that much of it. However, since many models come with built-in modems, or make it easy to attach them, one popular way to get new software is to download it from information services, such as CompuServe or The Source. Often, a "sign-up" kit to these services is included with purchase of the computer.

Also, these built-in modems go a long way toward making up for the lack of mass-storage capability. Since many people—especially commuting businesspeople, students, and journalists—who buy portables already own a conventional computer, they can upload files to it with the modem.

FLIP-TOPS

If transportables are too bulky and heavy, and portables too small to be truly powerful, flip-tops fall in between. They are called flip-tops because their screens, instead of lying flat on the system unit, flip up at an angle. Because the screens are, in a sense, separate from the system, they are often bigger. The SHARP PC-5000, for instance, displays text in an 80-character × 8-line format. Apple is developing a "flat panel display" for the new APPLE IIC. This flip-top screen will attach to the unit and display text in an 80 × 24 format.

When this panel display is available, the IIC, which has a built-in disk drive and 128K, will offer nearly as much power as some business desktops—in a 7 1/2-pound package. The same is true of the SHARP PC-5000, with its 128K (expandable to 256K). It weighs less than 10 pounds.



Sharp's PC-5000

The latest flip-top, Hewlett-Packard's THE PORTABLE, is more powerful and expensive. It has 272K RAM, an 80 × 16 text display, and sells for \$2,995. The HP Portable can upload and download programs from the IBM PC and XT, and the HP 150. It is also the first portable with a best-selling piece of software built in—*Lotus 1-2-3*. With the optional battery-operated ink-jet printer and a 3 1/2-inch disk drive, the system weighs less than 20 pounds. **EC**

Will Harvey:

BY
JAMES DELSON



As Will Harvey tells it, he's just like the kid next door. The 17-year-old certainly has a lot in common with other teenagers. He plays football, toys with model trains, and wears a grin that simply can't be as innocent as it looks. He is devious—in his programming, that is. He proved that when he wrote Electronic Arts' Music Construction Set (MCS), released in 1983. The innovative program serves as a teaching tool, a game, and a composition aid. It was widely hailed as an important and original work with long-lasting value for novices and professionals. Harvey had earlier created several published and unpublished programs, including *Lancaster*, an action/arcade game, and *Grade Base Manager*, a grading program for his schoolteacher mother. With the release of MCS, he became an overnight sensation. In October 1983, *TIME* magazine wrote a full-page story about him. Now graduated from high school and on his way to a career not in computers, Harvey spoke with *FAMILY COMPUTING* about MCS and his recent projects, and offered some programming tips.

FC: How did you come up with the idea for Music Construction Set?

Harvey: I had written *Lancaster*, and I needed music to accompany it. I didn't know much about music, so I set out to write a program in

which I could create it. I had to make something that would translate from me to the machine.

FC: I can't read a note of music, but with this program I quickly began to understand the basics of composition—how long a note can be held, what a sharp is, how to compose a tune.

Harvey: It's interactive, so you can use the computer as a tool to teach yourself. It's not instructing you; it just provides the environment to learn. For example, you can point at a note to find out what it is, then play it so you can hear what it sounds like, then have it displayed to see what it looks like. All of these aspects are coordinated, which I don't think happens in any other medium.

FC: Your program turns the computer into the ideal teaching station.

Harvey: That's what's really neat about computers. They're the perfect medium for teaching oneself.

FC: Do you suppose you could design a program to have students teach themselves other subjects? A *Homework Construction Set*?

Harvey: It'd sell a million.

FC: The Music Construction Set was originally created to be used with the Mockingboard, a sound-enhancement device which can be used

In Tune with Success

with an Apple computer. Is that the best sound you can obtain with the MCS?

Harvey: Once people realized how much fun the program is and how much more fun they can have when it's played through Mockingboards, they went out and bought them. But if a person has a choice of machines to use the program on, I would recommend the Commodore 64 version. With that computer, you can actually choose which instrument you want to play: harpsichord, piano, organ, or banjo . . . there are a lot of instruments you can play.

FC: Do you feel that the success you've had with this program and all the attention you've attracted has affected you?

Harvey: No.

FC: How many 16-year-olds get featured in a full-page article in *TIME* magazine?

Harvey: Not too many, that's true. But it hasn't affected me. It doesn't set me on a different cloud. I don't see computers as being different from any other hobby, like working on [model] trains, which is another one of my favorite things to do. A question I've been asked many times is, "Once you've been in *TIME*, then what else can you hope for?" They think I won't keep striving for things, or that I won't be able to concentrate on other projects.

FC: Do you have other projects in the works?

Harvey: Three of them. Two games and one other project that I can't talk about.

FC: What can you tell us about them?

Harvey: The games are both fast-action, and one is also an adventure. A lot of people have made attempts at fantasy, role-playing, and adventure games, so that's a big genre. Another genre is fast-action games, where things are actually moving on the screen and you get to interact. But until now those elements have been separate. For the most part, I'm bringing them together, so you'll get to fantasize and participate.

FC: A lot of people who will read this interview have just started using computers. Others have been using them for a long time. Sooner or later, though, most will consider writing a program, large or small, business or game. Could you offer some advice?

Harvey: Well, first let me suggest a goal. It's a stage which I'm at now. It's having confidence in what you're doing, so you're not afraid to take chances when you embark on a new project. You want to be comfortable enough to address any problem of any size.

FC: How do you achieve that?

Harvey: Practice. Begin by teaching yourself how to write an easy program, using whatever aids you can, such as tutors, books, magazine articles—anything that can move you along.

FC: What are the initial steps in creating a program?

Harvey: First, and most important, don't go in with the conviction that you can do anything, because when you start out, you can't. Take on a small project and work your way up. After a few programs, you'll see improvement. Eventually, you'll recognize the point when your ideas start reaching the realm of the impossible; you feel that you can actually achieve whatever you want. That's where I am now. That's when it gets to be really fun.

FC: Do you physically write things down on paper? Make sketches? Keep it all in your head?

Harvey: I love checking things off lists, so I work up a list of things I want to include in a program and cross each one off as I finish it. I keep three notebooks, one for school, one for home, and one in my back pocket. Whenever I get an idea I write it down. Then, I organize those thoughts and put them into a coherent outline. I made a mistake by not doing that in the beginning of *Music Construction Set*. I never envisioned all the features I'd add to it later; I had to do a great deal of extra work as a result of those oversights.

FC: What's the step after the list and outline?

Harvey: Don't do anything in haste. Get your friends to look over the outline. If they find problems, you can rework them carefully. When you have everything making sense, draw a picture of what you want the screen to look like. Next, begin the program by starting to create what goes on the screen. Make sure that when you've finished your list you're done with the product.

FC: You're not going to study computer science in college. What's ahead for you instead?

Harvey: I want to spend my college and professional careers learning about other things. A lot in the humanities. Maybe the classics. . . . I already have a base in Latin.

FC: That's it. Will Harvey's *Latin Construction Set*.

Harvey: When you think *Construction Set*, a lot of new ideas pop into your mind. It's a powerful way of doing things. **FC**

"(COMPUTERS) ARE THE PERFECT MEDIUM FOR TEACHING ONESELF."

"EVENTUALLY, YOU'LL RECOGNIZE THE POINT WHEN YOUR IDEAS START REACHING THE REALM OF THE IMPOSSIBLE."

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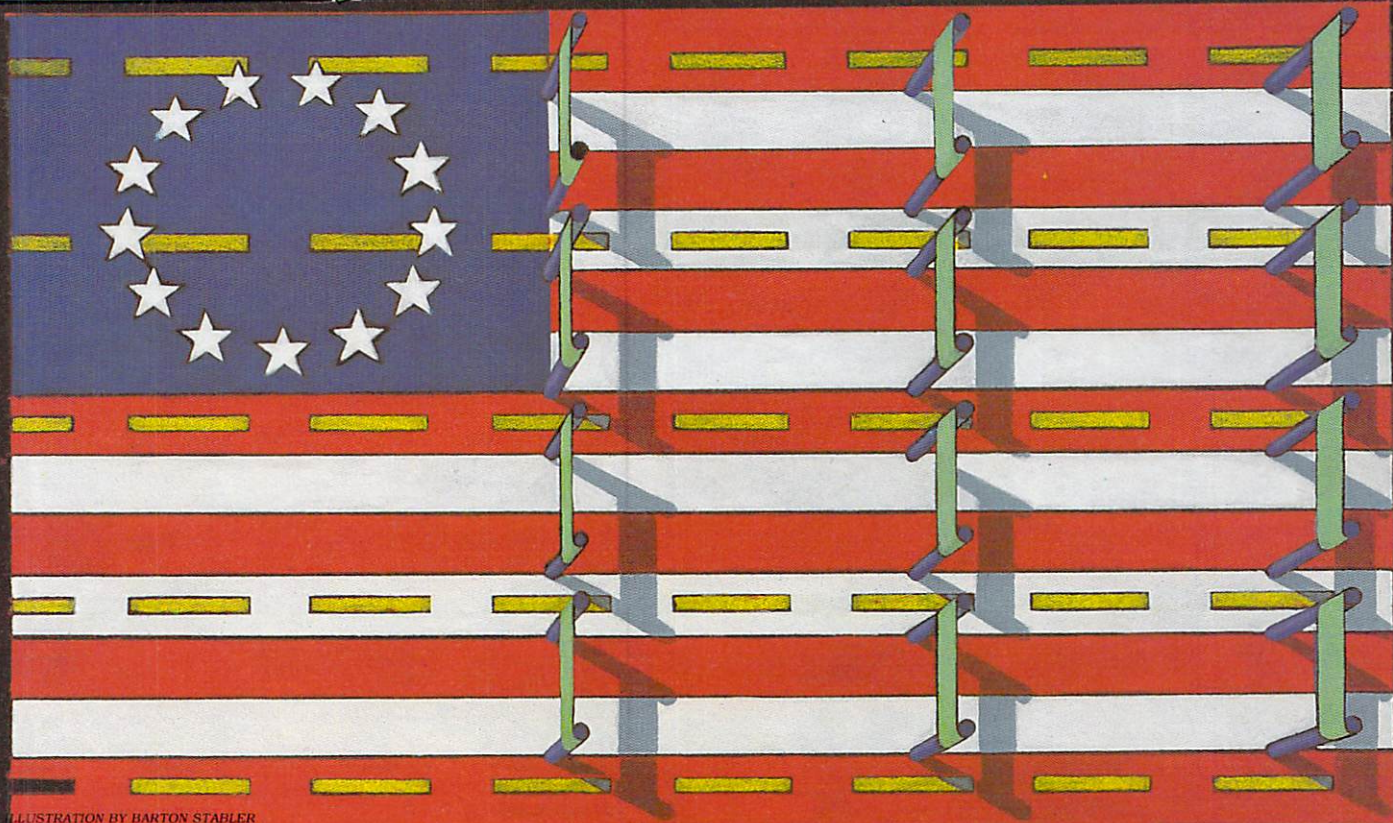


ILLUSTRATION BY BARTON STABLER



J U L Y



BEGINNER PROGRAMS

Page 56

Celebrate the 4th in front of a tolling
Liberty Bell
right in your own home;
then try your hand at becoming a
Portrait artist.

READER-WRITTEN PROGRAMS

Page 76

A bedtime story that won't put your
kids to sleep: For the TI-99/4A;
and an old 1776 American flag to raise
on the screen of your
IBM PC this Independence Day.

ILLUSTRATION BY JIM CHERRY III

Cherry

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BY JOEY LATIMER

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ADAM/Liberty Bell

```

9 REM --INITIALIZE--
10 a=5
20 n=1
30 HOME
40 GR
49 REM --DRAW BELL--
50 COLOR= 3
60 FOR co=2 TO 37
70 READ y
80 VLIN 0,y AT co
90 NEXT co
100 COLOR= 10
110 PLOT 17,3
120 PLOT 22,3
130 COLOR= 13
140 FOR ro=4 TO 32
150 READ x,y
160 HLIN x,y AT ro
170 NEXT ro
179 REM --SWING CLAPPER--
180 FOR q=1 TO 170
190 COLOR= 5
200 PLOT a,34
210 FOR t=1 TO 60
220 NEXT t
230 IF q/31<>INT(q/31) THEN 260
239 REM --RING BELL--
240 PRINT CHR$(7);
250 n=-n
260 IF q<155 THEN 340
269 REM --BREAK BELL--
270 COLOR= 9
280 FOR ro=32 TO 21 STEP -1
290 READ co
300 PLOT co,ro
310 FOR c=1 TO 12
320 NEXT c
330 NEXT ro
340 COLOR= 0
350 IF q<170 THEN PLOT a,34
360 a=a+n
    
```

```

370 NEXT q
380 FOR x=1 TO 500
390 NEXT x
400 PRINT TAB(2);"Press any key to begin again."
409 REM --WAIT FOR KEYPRESS--
410 GET k$
420 RUN
1000 DATA 9,9,9,9,9,9,9,7,6,5,4,3,3,3,3,3,3,3
1010 DATA 3,3,3,3,3,4,5,6,7,9,9,9,9,9,9,16,23,15
1020 DATA 24,14,25,13,26,12,27,12,27,11,28,11,28
1030 DATA 11,28,11,28,11,28,11,28,10,29,10,29,10
1040 DATA 29,10,29,9,30,9,30,8,31,8,31,7,32,7,32
1050 DATA 6,33,6,33,5,34,4,35,3,36,3,36,3,36,20,20
1060 DATA 20,19,18,17,16,16,15,15,15,15
    
```

Apple/Liberty Bell

```

9 REM --INITIALIZE--
10 A=5
20 N=1
30 HOME
40 GR
49 REM --DRAW BELL--
50 COLOR= 8
60 FOR CO=2 TO 37
70 READ Y
80 VLIN 0,Y AT CO
90 NEXT CO
100 COLOR= 10
110 PLOT 17,3
120 PLOT 22,3
130 COLOR= 13
140 FOR RO=4 TO 32
150 READ X,Y
160 HLIN X,Y AT RO
170 NEXT RO
179 REM --SWING CLAPPER--
180 FOR Q=1 TO 170
190 COLOR= 5
200 PLOT A,34
210 FOR T=1 TO 20
220 NEXT T
230 IF Q/31<>INT(Q/31) THEN 260
239 REM --RING BELL--
240 PRINT CHR$(7)
250 N=-N
260 IF Q<155 THEN 350
269 REM --BREAK BELL--
270 COLOR= 9
280 FOR RO=32 TO 21 STEP -1
290 READ CO
300 PLOT CO,RO
310 FOR C=1 TO 12
320 Z = PEEK(-16336)
330 NEXT C
340 NEXT RO
350 COLOR= 0
360 IF Q<170 THEN PLOT A,34
370 A=A+N
380 NEXT Q
390 FOR X=1 TO 500
400 NEXT X
410 PRINT TAB(7);"PRESS ANY KEY TO BEGIN AGAIN."
419 REM --WAIT FOR KEYPRESS--
420 GET K$
430 RUN
1000 DATA 9,9,9,9,9,9,9,7,6,5,4,3,3,3,3,3,3,3
1010 DATA 3,3,3,3,3,4,5,6,7,9,9,9,9,9,9,9,9,9
1020 DATA 16,23,15,24,14,25,13,26,12,27,12,27
1030 DATA 11,28,11,28,11,28,11,28,11,28,11,28
1040 DATA 10,29,10,29,10,29,10,29,9,30,9,30
1050 DATA 8,31,8,31,7,32,7,32,6,33,6,33,5,34
1060 DATA 4,35,3,36,3,36,3,36,20,20,20,19,18
1070 DATA 17,16,16,15,15,15,15
    
```


Atari/Liberty Bell

```
9 REM --INITIALIZE--
10 OPEN #1,4,0,"K:"
20 A=11
30 N=1
40 GRAPHICS 3
50 POKE 752,1
59 REM --DRAW BELL--
60 SETCOLOR 2,0,0
70 COLOR 2
80 FOR CO=3 TO 36
90 READ Y
100 PLOT CO,0
110 DRAWTO CO,Y
120 NEXT CO
130 COLOR 1
140 FOR CO=8 TO 31
150 READ Y
160 PLOT CO,17
170 DRAWTO CO,Y
180 NEXT CO
189 REM --SWING CLAPPER--
190 FOR Q=1 TO 104
200 COLOR 2
210 PLOT A,18
220 FOR T=1 TO 30
230 NEXT T
240 IF Q/19<>INT(Q/19) THEN 320
249 REM --RING BELL--
250 FOR Z=15 TO 0 STEP -1
260 SOUND 0,80,10,Z
270 FOR T=0 TO 15
280 NEXT T
290 NEXT Z
300 SOUND 0,0,0,0
310 N=-N
320 IF Q<>95 THEN 420
329 REM --BREAK BELL--
330 COLOR 0
340 FOR RO=17 TO 10 STEP -1
350 READ CO,Z
360 SOUND 0,Z,4,15
370 FOR T=1 TO 20
380 NEXT T
390 SOUND 0,0,0,0
400 PLOT CO,RO
410 NEXT RO
420 COLOR 0
430 IF Q<>104 THEN PLOT A,18
440 A=A+N
450 NEXT Q
460 FOR T=1 TO 500
470 NEXT T
480 POKE 657,6
490 PRINT "PRESS ANY KEY TO BEGIN AGAIN."
499 REM --WAIT FOR KEYPRESS--
500 GET #1,K
510 RUN
1000 DATA 6,6,6,6,6,6,6,6,4,3,2,1,1,1,1,1
1010 DATA 1,1,1,1,1,1,2,3,4,6,6,6,6,6,6,6
1020 DATA 16,15,14,12,7,5,4,3,2,3,2,2,2,2
1030 DATA 3,2,3,4,5,7,12,14,15,16,20,68,20,64
1040 DATA 19,60,18,57,17,50,16,45,16,40,16,37
```

Commodore 64/Liberty Bell

```
9 REM --INITIALIZE--
10 D=40
20 G=1911
30 A=56183
40 CB=55296
50 SB=1024
60 S=54272
```

```
70 N=1
80 FOR X=54272 TO 54296
90 POKE X,0
100 NEXT X
110 POKE 53280,12
120 POKE 53281,12
130 POKE S+24,15
140 POKE S+5,17
150 POKE S+6,187
160 POKE S+1,22
170 POKE S,227
180 PRINT CHR$(147)
189 REM --DRAW BELL--
190 FOR CO=2 TO 37
200 READ Y
210 FOR RO=0 TO Y
220 POKE SB+CO+40*RO,160
230 POKE CB+CO+40*RO,0
240 NEXT RO
250 NEXT CO
260 FOR RO=2 TO 21
270 READ X,Y
280 FOR CO=X TO Y
290 POKE SB+CO+40*RO,160
300 POKE CB+CO+40*RO,9
310 NEXT CO
320 NEXT RO
330 POKE 1120,160:POKE S+1120,0:POKE 1127,160:POKE S+1127,0
339 REM --SWING CLAPPER--
340 FOR Q=1 TO 143
350 POKE G,85:POKE G+1,73:POKE G+40,74:POKE G+41,75
360 POKE A,0:POKE A+40,0:POKE A+1,0:POKE A+41,0
370 IF Q/26<>INT(Q/26) THEN 430
379 REM --RING BELL--
380 POKE S+4,17
390 FOR T=1 TO 200
400 NEXT T
410 POKE S+4,16
420 N=-N
430 IF Q<>130 THEN 550
439 REM --BREAK BELL--
440 FOR RO=21 TO 13 STEP -1
450 READ CO,HI,LO
460 POKE S+1,HI
470 POKE S,LO
480 POKE S+4,129
490 FOR T=1 TO 20
500 NEXT T
510 POKE S+4,128
520 POKE SB+CO+40*RO,102
530 POKE CB+CO+40*RO,0
540 NEXT RO
550 IF Q=143 THEN 590
560 POKE A,12:POKE A+1,12:POKE A+40,12:POKE A+41,12
570 POKE G,0:POKE G+1,0:POKE G+40,0:POKE G+41,0
580 G=G+N:A=A+N
590 NEXT Q
600 FOR X=1 TO 1500
610 NEXT X
620 POKE 214,23:PRINT
630 POKE 211,6
640 PRINT CHR$(144);"PRESS ANY KEY TO BEGIN AGAIN.";
649 REM --WAIT FOR KEYPRESS--
650 GET K$
660 IF K$="" THEN 650
670 RUN
1000 DATA 6,6,6,6,6,6,6,6,4,3,2,1,1,1,1,1
1010 DATA 1,1,1,1,1,1,1,2,3,4,6,6,6,6,6,6
1020 DATA 15,24,14,25,13,26,12,27,12,27
1030 DATA 11,28,11,28,11,28,11,28,11,28,11,28
1040 DATA 10,29,10,29,10,29,9,30,8,31,7,32,6,33
1050 DATA 5,34,5,34,20,22,227,20,24,63,19,27,56
1060 DATA 18,34,94,17,43,52,16,51,97,16,57,172
1070 DATA 16,61,126,16,64,188
```


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BEGINNER PROGRAMS

```

110 PRINT AT Z,X;C$
120 NEXT Z
130 NEXT X
140 LET C$=CHR$ 136
150 LET D$="12,18,11,19,10,20,9,21,8,22,8,22,8,22,8,2
2,8,22,8,22,8,22,8,22,7,23,7,23,6,24,5,25,4,26,"
160 LET P1=1
170 LET P2=1
180 FOR X=3 TO 19
190 GOSUB 1000
200 LET B=DAT
210 GOSUB 1000
220 FOR Z=B TO DAT
230 PRINT AT X,Z;C$
240 NEXT Z
250 NEXT X
260 PRINT AT 3,13;CHR$ 0;AT 3,17;CHR$ 0
270 SLOW
279 REM --SWING CLAPPER--
280 FOR Q=1 TO 110
290 PRINT AT 20,A;CHR$ 128
300 IF Q/20=INT (Q/20) THEN LET N=-N
310 IF Q<>100 THEN GOTO 390
319 REM --BREAK BELL--
320 LET D$="17,16,15,15,14,13,"
330 LET P1=1
340 LET P2=2
350 FOR X=19 TO 14 STEP -1
360 GOSUB 1000
370 PRINT AT X,DAT;CHR$ 128
380 NEXT X
390 IF Q<>110 THEN PRINT AT 20,A;CHR$ 0
400 LET A=A+N
410 NEXT Q
420 FOR T=1 TO 50
430 NEXT T
440 PRINT AT 21,2;"PRESS ANY KEY TO START AGAIN."
449 REM --WAIT FOR KEYPRESS--
450 IF INKEY$="" THEN GOTO 450
460 RUN
1000 IF D$(P1)="," THEN GOTO 1030
1010 LET P1=P1+1
1020 GOTO 1000
1030 LET DAT=VAL (D$(P2 TO P1-1))
1040 LET P1=P1+1
1050 LET P2=P1
1060 RETURN

```

TRS-80 Color Computer/Liberty Bell

```

9 REM --INITIALIZE--
10 A=452
20 N=1
30 CLS
39 REM --DRAW BELL--
40 FOR CO=2 TO 29
50 READ Y
60 FOR RO=0 TO Y
70 PRINT @CO+32*RO,CHR$(128);
80 NEXT RO
90 NEXT CO
100 FOR RO=1 TO 13
110 READ X,Y
120 FOR CO=X TO Y
130 PRINT @CO+32*RO,CHR$(159);
140 NEXT CO
150 NEXT RO
160 PRINT @44,CHR$(224);
170 PRINT @51,CHR$(224);
179 REM --SWING CLAPPER--
180 FOR Q=1 TO 137
190 PRINT @A,CHR$(128);
200 FOR T=1 TO 25
210 NEXT T
220 IF Q/25<>INT(Q/25) THEN 250
229 REM --RING BELL--

```

```

230 SOUND 55,7
240 N=-N
250 IF Q<>125 THEN 310
259 REM --BREAK BELL--
260 FOR RO=13 TO 7 STEP -1
270 READ CO,Z
280 SOUND Z,3
290 PRINT @CO+32*RO,CHR$(175);
300 NEXT RO
310 IF Q<>137 THEN PRINT @A,CHR$(143);
320 A=A+N
330 NEXT Q
340 FOR T=1 TO 500
350 NEXT T
360 PRINT @482,"PRESS ANY KEY TO BEGIN AGAIN.";
369 REM --WAIT FOR KEYPRESS--
370 K$=INKEY$
380 IF K$="" THEN 370
390 RUN
1000 DATA 2,2,2,2,2,2,1,0,0,0,0,0,0,0,0,0,0
1010 DATA 0,0,0,0,1,2,2,2,2,2,2
1020 DATA 11,20,10,21,9,22,8,23,7,24,7,24,6,25
1030 DATA 6,25,5,26,4,27,4,27,2,29,2,29,15,70
1040 DATA 15,75,14,80,13,85,12,90,11,100,11,110

```

TRS-80 Model III/Liberty Bell

```

9 REM --INITIALIZE--
10 A=907
20 N=1
30 CLS
39 REM --DRAW BELL--
40 FOR RO=1 TO 20
50 READ X,Y
60 FOR CO=X TO Y
70 PRINT @CO,CHR$(191);
80 NEXT CO
90 NEXT RO
99 REM --SWING CLAPPER--
100 FOR Q=1 TO 236
110 PRINT @A,CHR$(191);
120 IF Q/43<>INT(Q/43) THEN 140
130 N=-N
140 IF Q<>215 THEN 190
149 REM --BREAK BELL--
150 FOR RO=1 TO 7
160 READ LO
170 PRINT @LO,CHR$(128);
180 NEXT RO
190 IF Q<>236 THEN PRINT @A,CHR$(128);
200 A=A+N
210 NEXT Q
220 FOR X=1 TO 500
230 NEXT X
240 PRINT @977,"PRESS ANY KEY TO BEGIN AGAIN.";
249 REM --WAIT FOR KEYPRESS--
250 K$=INKEY$
260 IF K$="" THEN 250
270 RUN
1000 DATA 7,56,71,120,135,146,173,184,199,207
1010 DATA 240,248,151,153,155,164,166,168,213,234
1020 DATA 275,300,338,365,401,430,464,495,527,560
1030 DATA 589,626,651,692,714,757,776,823,840,887
1040 DATA 863,799,734,669,604,539,474

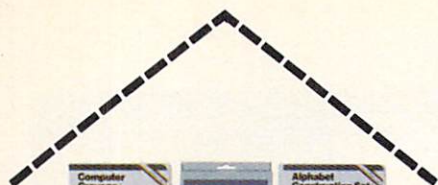
```

VIC-20/Liberty Bell

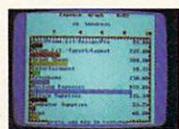
```

9 REM --INITIALIZE--
10 D=22
20 CB=38400
30 SB=7680
40 S=36876
50 A=8079
60 C=30720

```

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```

70 N=1
80 POKE C+3,25
90 PRINT CHR$(147)
99 REM --DRAW BELL--
100 FOR CO=1 TO 20
110 READ Y
120 FOR RO=0 TO Y
130 POKE SB+CO+D*RO,160
140 POKE CB+CO+D*RO,0
150 NEXT RO
160 NEXT CO
170 FOR RO=3 TO 17
180 READ X,Y
190 FOR CO=X TO Y
200 POKE SB+CO+D*RO,160
210 POKE CB+CO+D*RO,7
220 NEXT CO
230 NEXT RO
240 POKE 7733,160
250 POKE 7736,160
260 POKE 38453,0
270 POKE 38456,0
279 REM --SWING CLAPPER--
280 FOR Q=1 TO 93
290 POKE A+C,0
300 POKE A,81
310 FOR T=1 TO 50
320 NEXT T
330 IF Q/17<>INT(Q/17) THEN 420
339 REM --RING BELL--
340 FOR V=15 TO 0 STEP -1
350 FOR T=1 TO 30
360 NEXT T
370 POKE 36878,V
380 POKE 36874,239
390 NEXT V
400 POKE 36874,0
410 N=-N
420 IF Q<>85 THEN 540
429 REM --BREAK BELL--
430 POKE 36878,15
440 FOR RO=17 TO 10 STEP -1
450 READ CO
460 POKE SB+CO+D*RO,102
470 X=X+10
480 POKE 36877,X+150
490 FOR T=1 TO 20
500 NEXT T
510 POKE 36877,0
520 POKE CB+CO+D*RO,0
530 NEXT RO
540 IF Q<>93 THEN POKE A,32
550 A=A+N
560 NEXT Q
570 FOR T=1 TO 1500
580 NEXT T
590 POKE 214,20
600 PRINT
610 PRINT CHR$(144); " PLEASE PRESS ANY KEY.";
619 REM --WAIT FOR KEYPRESS--
620 GET K$
630 IF K$="" THEN 620
640 RUN
1000 DATA 3,3,3,3,2,1,1,1,1,1,1,1,2,3,3,3,3
1010 DATA 8,13,7,14,6,15,5,16,5,16,5,16,5,16
1020 DATA 4,17,4,17,4,17,3,18,2,19
1030 DATA 1,20,1,20,1,20,11,11,11,10,9,8,8,8

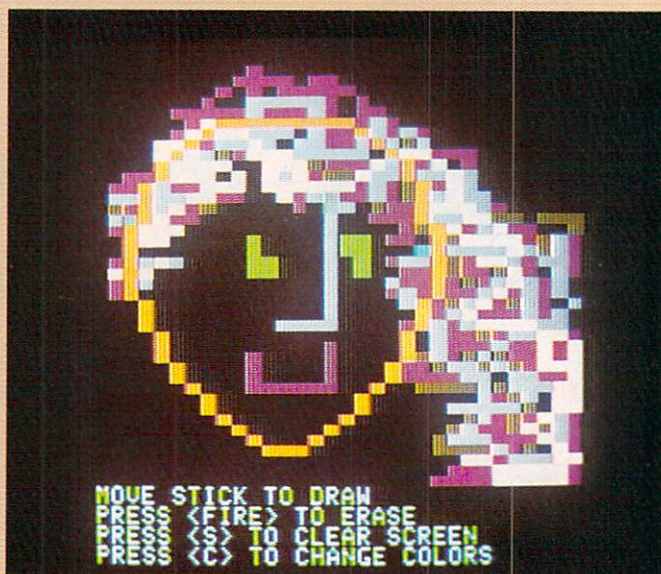
```

SOLUTION TO LAST MONTH'S PUZZLE

You may have noticed that three of the chefs always give you the same wrong telephone number. If you look at the numbers on a telephone, you will see that each digit (except for 1 and 0) is accompanied by letters of the alphabet. Wrong numbers spell the names of guilty chefs. For example, the wrong number 945-4356 tells you that W-I-L-H-E-L-M stole your recipe.

PORTRAIT

BY JOEY LATIMER



If you've always wanted to be a Rembrandt, but can't stand the smell of turpentine, then this program may be just the thing for you! *Portrait* draws the outline of a face and leaves the rest up to you.

Set your computer to all uppercase letters before running the program (except for the TI-99/4A). First choose the color of your "brush" (this applies only to computers with built-in color capabilities) by pressing the "C" key. When you've selected a color, type "F" and the face outline will appear on your screen.

You can draw either with a joystick or by using your keyboard (type "D" and use the direction keys previously indicated on the screen). To erase, type "E" and again use your direction keys. Or, hold down the fire button on your joystick. You can change "brush" colors at any point by pressing the "C" key.

To clear your drawing from the screen press the "S" key. When you're finished, type "Q" for quit.

If you wish to draw on a blank screen, don't type "F" for face outline at the beginning.

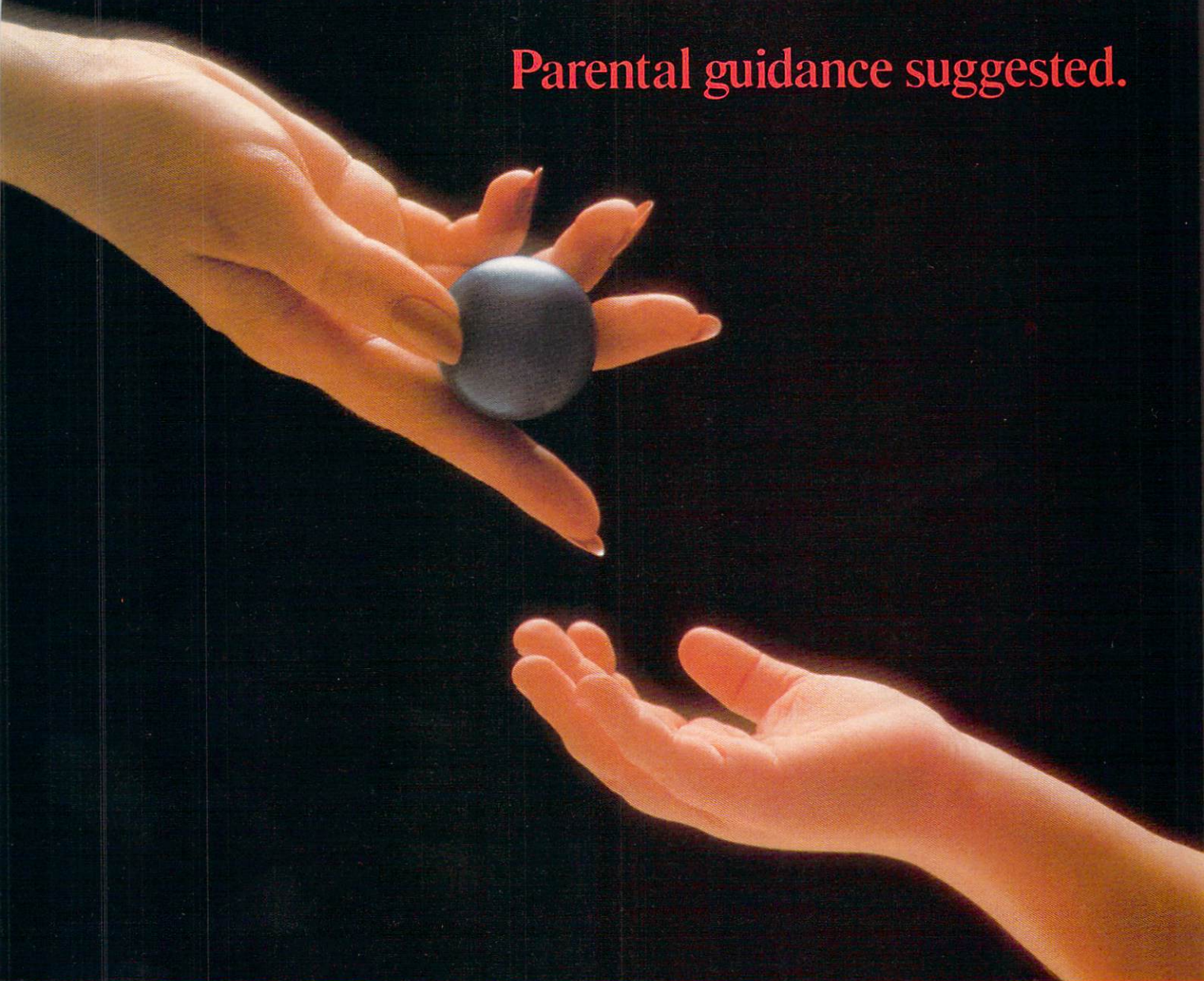
ADAM/*Portrait*

```

10 DIM j(8),xt(8),yt(8)
20 REM --PRINT INSTRUCTIONS--
20 HOME
30 PRINT " PLEASE PLUG CONTROLLER INTO"
40 PRINT " PORT #1. USE KEYPAD FOR INPUT."
50 PRINT TAB(36);"PRESS ANY KEY TO BEGIN."
60 GET r$
70 HOME
80 HGR
90 FOR i = 1 TO 8
100 READ j(i),xt(i),yt(i)
110 NEXT i
120 READ x,y,nc,s
130 VTAB 22
140 PRINT "USE STICK TO DRAW <FIRE>=ERASE";
150 PRINT " 1=CHANGE COLOR 3=DRAW FACE"
160 PRINT " 7=QUIT";SPC(9);"9=CLEAR SCREEN"
170 IF s = 1 THEN HCOLOR= 0:HPLLOT hc,hr
180 HCOLOR= nc
190 HPLLOT x,y
200 hc = x
210 hr = y

```


Parental guidance suggested.



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Childpace assesses his skill level based on extensive research, not the biased opinions of friends or relatives. Childpace uses your child's chronological (actual) age.

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As your child grows, the tasks change to match his newly acquired skills. So Childpace is just as valuable for a 48-month old child as for an infant. Childpace can even evaluate up to 16 different children, and keep permanent records on each of them. Snapshots record your child's physical growth, but Childpace documents his or her actual development.

Track your child's progress, and help him develop specific skills. Childpace also contains warning signals to alert you to potential developmental problems at an early age, before they hold your child back. An ounce of prevention pays off.

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\$39.95 suggested retail price

Childpace is available for the Commodore 64®, IBM PC®, IBM PC Jr.®, Atari 800®, Apple II®, and Radio Shack Color Computer.®*

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BEGINNER PROGRAMS

```

219 REM --READ JOYSTICK--
220 k = PDL(13)
230 IF k = 15 THEN 300
240 IF k = 1 THEN nc = nc+1
250 IF nc = 3 THEN nc = 5
260 IF nc > 15 THEN nc = 1
270 IF k = 3 THEN 420
280 IF k = 7 THEN TEXT:HOME:END
290 IF k = 9 THEN RESTORE:GOTO 80
300 s = 2
310 IF PDL(7) = 1 OR PDL(9) = 1 THEN s = 1
320 jv = PDL(5)
330 IF jv = 0 THEN 170
340 FOR i = 1 TO 8
350 IF jv = j(i) THEN x = x+xt(i):y = y+yt(i):i = 8
360 NEXT i
370 IF x > 254 THEN x = 0
380 IF x < 0 THEN x = 254
390 IF y > 159 THEN y = 0
400 IF y < 0 THEN y = 159
410 GOTO 170
419 REM --DRAW FACE--
420 FOR i = 1/40 TO 8*ATN(1) STEP 1/40
430 HPLLOT SIN(i)*48+127,COS(i)*64+79
440 NEXT i
450 GOTO 200
1000 DATA 1,0,-1,2,1,0,3,1,-1,4,0,1
1010 DATA 6,1,1,8,-1,0,9,-1,-1,12,-1,1
1020 DATA 128,80,2,2

```

Apple/Portrait

```

10 DIM K$(8),XT(8),YT(8)
19 REM --PRINT INSTRUCTIONS--
20 HOME
30 PRINT "DO YOU WANT TO USE THE <K>EYBOARD OR","<J>OY
STICK?"
40 GET C$
50 IF C$ <> "K" AND C$ <> "J" THEN 40
60 HOME
70 IF C$ = "J" THEN PRINT "PLEASE PLUG IN YOUR JOYSTIC
K AND CENTER THE STICK.":GOTO 120
80 PRINT TAB(47);"HERE ARE YOUR DRAWING KEYS:"
90 PRINT TAB(57);"U I O"
100 PRINT TAB(57);"J L"
110 PRINT TAB(57);"M ."
120 PRINT TAB(49);"PRESS ANY KEY TO BEGIN."
130 GET R$
140 IF C$ = "J" THEN XS = PDL(0):YS = PDL(1)
150 HOME
160 HGR
170 FOR I = 1 TO 8
180 READ K,XT(I),YT(I)
190 K$(I) = CHR$(K)
200 NEXT I
210 READ X,Y,NC,S
220 VTAB 22
230 IF C$ = "K" THEN PRINT " D=DRAW";SPC(18);"E=ERASE"
:GOTO 250
240 PRINT " MOVE STICK TO DRAW";SPC(6);"<FIRE>=ERASE"
250 PRINT " C=CHANGE COLOR";SPC(10);"F=DRAW FACE"
260 PRINT " Q=QUIT";SPC(18);"S=CLEAR SCREEN"
269 REM --ERASE AND PLOT PIXEL--
270 IF S = 1 THEN HCOLOR=0:HPLLOT HC,HR:HPLLOT HC+1,HR
280 HCOLOR= NC
290 HPLLOT X,Y
300 HPLLOT X+1,Y
310 HC = X
320 HR = Y
329 REM --READ KEYBOARD--
330 K = PEEK(49152)
340 IF K < 127 AND C$ = "K" THEN 330
350 IF K < 127 AND C$ = "J" THEN K$ = "":GOTO 470
360 K$ = CHR$(K-128)
370 POKE 49168,0
380 IF K$ = "E" THEN S = 1

```

```

390 IF K$ = "D" THEN S = 2
400 IF K$ = "S" THEN RESTORE:GOTO 150
410 IF K$ = "C" THEN NC = NC+1
420 IF NC = 4 THEN NC = 5
430 IF NC > 7 THEN NC = 1
440 IF K$ = "F" THEN 620
450 IF K$ = "Q" THEN TEXT:HOME:END
460 IF C$ = "K" THEN 540
469 REM --READ JOYSTICK--
470 S = 2
480 IF PEEK(49249) > 127 THEN S = 1
490 IF PDL(0) < XS-15 THEN X = X-1
500 IF PDL(0) > XS+15 THEN X = X+1
510 IF PDL(1) < YS-15 THEN Y = Y-1
520 IF PDL(1) > YS+15 THEN Y = Y+1
530 GOTO 570
540 FOR I = 1 TO 8
550 IF K$ = K$(I) THEN X = X+XT(I):Y = Y+YT(I):I = 8
560 NEXT I
570 IF X > 278 THEN X = 0
580 IF X < 0 THEN X = 278
590 IF Y > 159 THEN Y = 0
600 IF Y < 0 THEN Y = 159
610 GOTO 270
619 REM --DRAW FACE--
620 FOR I = 1/30 TO 8*ATN(1) STEP 1/30
630 XF = SIN(I)*52+139
640 YF = COS(I)*50+79
650 HPLLOT XF,YF
660 HPLLOT XF+1,YF
670 NEXT I
680 GOTO 290
1000 DATA 77,-1,1,44,0,1,46,1,1,74,-1,0
1010 DATA 76,1,0,85,-1,-1,73,0,-1,79,1,-1
1020 DATA 139,79,2,2

```

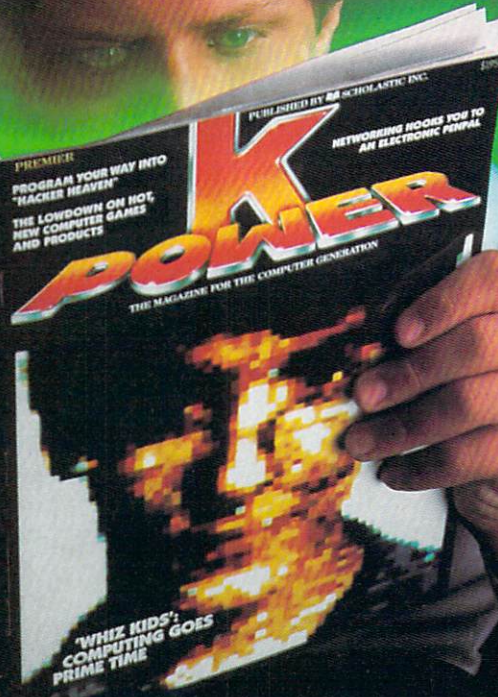
Atari/Portrait

```

10 DIM KT(9),J(9),XT(9),YT(9),TAB$(18)
20 OPEN #1,4,0,"K:"
30 GRAPHICS 0
40 TAB$(1)=CHR$(125)
50 TAB$(2)=CHR$(29)
60 FOR I=3 TO 18
70 TAB$(I)=" "
80 NEXT I
89 REM --PRINT INSTRUCTIONS--
90 PRINT "DO YOU WANT TO USE THE <K>EYBOARD OR","<J>OY
STICK?"
100 GET #1,C
110 IF C<>74 AND C<>75 THEN 100
120 FOR I=1 TO 9
130 READ E,F,G,H
140 J(I)=E
150 KT(I)=F
160 XT(I)=G
170 YT(I)=H
180 NEXT I
190 IF C=74 THEN PRINT TAB$(1,6);"PLEASE PLUG IN YOUR
JOYSTICK.":GOTO 240
200 PRINT TAB$(1,6);"HERE ARE YOUR DRAWING KEYS:"
210 PRINT TAB$(2,16);"U I O"
220 PRINT TAB$(2,16);"J L"
230 PRINT TAB$(2,16);"M ."
240 PRINT TAB$(2,9);"PRESS ANY KEY TO BEGIN."
250 GET #1,K
260 RESTORE 1020
270 READ X,Y,NC,S
280 GRAPHICS 7
290 POKE 752,1
300 PRINT #6,CHR$(125);
310 IF C=75 THEN PRINT "D=DRAW";TAB$(3,18);"E=ERASE":G
OTO 330
320 PRINT "MOVE STICK TO DRAW";TAB$(3,6);"<FIRE>=ERASE
"
330 PRINT "C=CHANGE COLOR";TAB$(3,10);"F=DRAW FACE"

```


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BEGINNER PROGRAMS

```

340 PRINT "Q=QUIT";TAB$(3,18);"S=CLEAR SCREEN"
349 REM --ERASE AND PLOT PIXEL--
350 IF S=1 THEN COLOR 0:PLOT HC,HR
360 COLOR NC
370 PLOT X,Y
380 HC=X
390 HR=Y
399 REM --READ KEYBOARD--
400 K=PEEK(764)
410 IF K<>255 THEN POKE 764,255
420 IF K=42 THEN S=1
430 IF K=58 THEN S=2
440 IF K=62 THEN S=260
450 IF K=18 THEN NC=NC+1
460 IF NC>3 THEN NC=1
470 IF K=56 THEN S80
480 IF K=47 THEN GRAPHICS 0:POKE 764,255:END
489 REM --READ JOYSTICK--
490 IF C=74 THEN JV=STICK(0):S=2:IF STRIG(0)=0 THEN S=
1
500 FOR I=1 TO 9
510 IF (C=74 AND JV=J(I)) OR (C=75 AND K=KT(I)) THEN X
=X+XT(I):Y=Y+YT(I):I=9
520 NEXT I
530 IF X>159 THEN X=0
540 IF X<0 THEN X=159
550 IF Y>79 THEN Y=0
560 IF Y<0 THEN Y=79
570 GOTO 350
579 REM --DRAW FACE--
580 PLOT 80,69
590 FOR I=1/25 TO 8*ATN(1) STEP 1/25
600 DRAWTO SIN(I)*28+80,COS(I)*30+39
610 NEXT I
620 GOTO 360
1000 DATA 15,-1,0,0,5,34,1,1,6,8,1,-1,7,0,1,0,9,37,-1
1010 DATA 1,10,11,-1,-1,11,1,-1,0,14,13,0,-1,13,32,0,1
1020 DATA 80,39,1,2

```

Commodore 64/Portrait

```

10 DIM KTS(8),XT(8),YT(8)
19 REM --PRINT INSTRUCTIONS--
20 POKE 53281,6
30 PRINT CHR$(147);"DO YOU WANT TO USE THE <K>EYBOARD
OR","<J>OYSTICK?"
40 GET CS
50 IF CS<>"K" AND CS<>"J" THEN 40
60 PRINT CHR$(147)
70 IF CS="K" THEN 100
80 PRINT "PLEASE PLUG YOUR JOYSTICK INTO CONTROL","POR
T 1."
90 GOTO 140
100 PRINT TAB(47);"HERE ARE YOUR DRAWING KEYS:"
110 PRINT TAB(56);"U I 0"
120 PRINT TAB(56);"J L"
130 PRINT TAB(56);"M ."
140 PRINT TAB(49);"PRESS ANY KEY TO BEGIN."
150 GET RS
160 IF RS="" THEN 150
170 PRINT CHR$(147)
180 FOR I=1 TO 8
190 READ JS(I),K,XT(I),YT(I)
200 KTS(I)=CHR$(K)
210 NEXT I
220 READ SM,CM,X,Y,NC,S
230 POKE 214,24
240 PRINT
250 IF CS="J" THEN PRINT "MOVE STICK TO DRAW";TAB(24);
"<FIRE> TO ERASE":GOTO 270
260 PRINT "D=DRAW";TAB(25);"E=ERASE"
270 PRINT "C=COLOR";TAB(9);"F=FACE";TAB(17);"Q=QUIT";T
AB(25);"S=CLEAR SCREEN";
279 REM --ERASE AND PLOT BLOCKS--
280 IF S=1 THEN POKE CM+HC+40*HR,6:POKE SM+HC+40*HR,16
0

```

```

290 POKE CM+X+40*Y,NC
300 POKE SM+X+40*Y,160
310 HC=X
320 HR=Y
329 REM --READ KEYBOARD--
330 GET KS
340 IF KS="" THEN 430
350 IF KS="E" THEN S=1
360 IF KS="D" THEN S=2
370 IF KS="S" THEN RESTORE:GOTO 170
380 IF KS="C" THEN NC=NC+1
390 IF NC>15 THEN NC=0
400 IF NC=6 THEN NC=7
410 IF KS="F" THEN S80
420 IF KS="Q" THEN PRINT CHR$(147):END
430 IF CS="K" THEN 490
439 REM --READ JOYSTICK--
440 S=2
450 JV=PEEK(56321)
460 FR=JV AND 16
470 IF FR=0 THEN S=1
480 JV=15-(JV AND 15)
490 FOR I=1 TO 8
500 IF CS="K" THEN IF KS=KTS(I) THEN X=X+XT(I):Y=Y+YT(
I):I=8:GOTO 520
510 IF CS="J" THEN IF JV=JS(I) THEN X=X+XT(I):Y=Y+YT(I
):I=8
520 NEXT I
530 IF X>39 THEN X=0
540 IF X<0 THEN X=39
550 IF Y>22 THEN Y=0
560 IF Y<0 THEN Y=22
570 GOTO 280
579 REM --DRAW FACE--
580 FOR I=1/8 TO 4.1*TAN(1) STEP 1/8
590 XFX=SIN(I)*7.5+19
600 YFX=COS(I)*8.5+11
610 POKE CM+XFX+40*YFX,NC
620 POKE SM+XFX+40*YFX,160
630 NEXT I
640 POKE CM+16+40*19,6
650 POKE SM+16+40*19,160
660 GOTO 290
1000 DATA 6,77,-1,1,2,44,0,1,10,46,1,1,4,74,-1,0
1010 DATA 8,76,1,0,5,85,-1,-1,1,73,0,-1,9,79,1,-1
1020 DATA 1024,55296,19,11,4,2

```

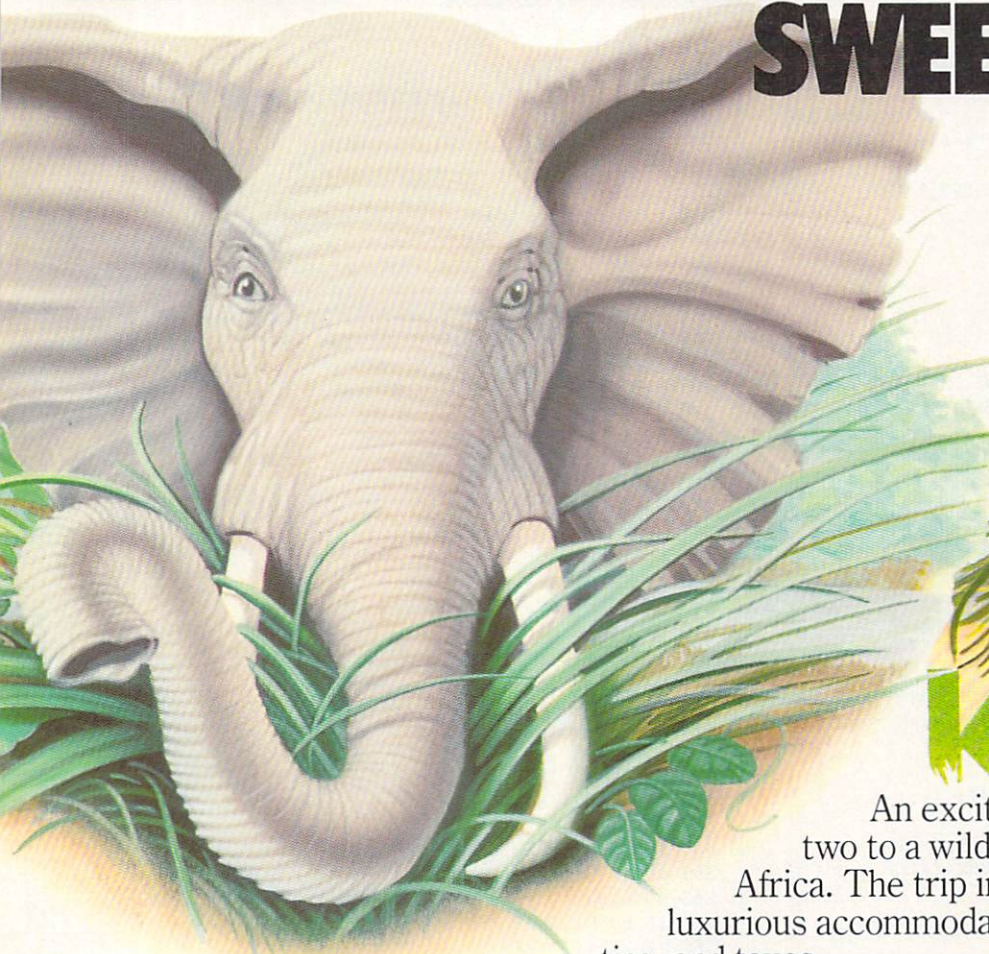
IBM PC w/Color Graphics Adapter & IBM PCjr/Portrait

```

10 DIM KTS(8),XT(8),YT(8)
20 WIDTH 40
30 KEY OFF
40 SCREEN 1,0
50 COLOR 0,2
60 LOCATE ,0
69 REM --PRINT INSTRUCTIONS--
70 CLS
80 PRINT "DO YOU WANT TO USE THE <K>EYBOARD OR","<J>OY
STICK?"
90 CS=INKEY$
100 IF CS<>"J" AND CS<>"K" THEN 90
110 CLS
120 IF CS="J" THEN STRIG ON:PRINT "PLEASE PLUG IN YOUR
JOYSTICK AND CENTER THE STICK.":GOTO 210
130 FOR I=1 TO 8
140 READ K,XT(I),YT(I)
150 KTS(I)=CHR$(K)
160 NEXT I
170 PRINT CHR$(31);TAB(8);"HERE ARE YOUR DRAWING KEYS:
"
180 PRINT CHR$(31);TAB(17);"U I 0"
190 PRINT CHR$(31);TAB(17);"J L"
200 PRINT CHR$(31);TAB(17);"M ."
210 PRINT CHR$(31);TAB(10);"PRESS ANY KEY TO BEGIN."
220 AS=INKEY$
230 IF AS="" THEN 220

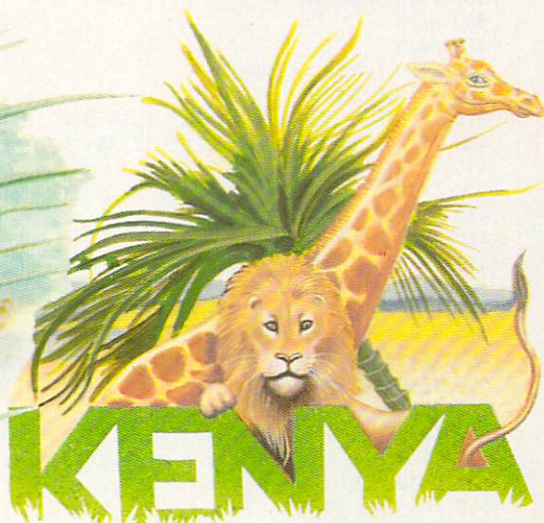
```


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BEGINNER PROGRAMS

```

240 IF C$="J" THEN XS=STICK(0):YS=STICK(1)
250 RESTORE 1020
260 READ X,Y,NC,S
270 CLS
280 LOCATE 23,2
290 IF C$="K" THEN PRINT "D=DRAW";SPC(17);"E=ERASE":GO
    TO 310
300 PRINT "MOVE STICK TO DRAW";SPC(5);"<FIRE>=ERASE"
310 PRINT " C=CHANGE COLOR";SPC(9);"F=DRAW FACE";
320 LOCATE 25,2
330 PRINT "Q=QUIT";SPC(17);"S=CLEAR SCREEN";
339 REM --ERASE AND PLOT PIXEL--
340 IF S=1 THEN PRESET(HC,HR),0
350 PSET(X,Y),NC
360 HC=X
370 HR=Y
379 REM --READ KEYBOARD--
380 K$=INKEY$
390 IF K$="" THEN IF C$="K" THEN 380 ELSE 460
400 IF K$="E" THEN S=1 ELSE IF K$="D" THEN S=2
410 IF K$="S" THEN 250
420 IF K$="C" THEN NC=NC+1
430 IF NC>3 THEN NC=1
440 IF K$="F" THEN 600
450 IF K$="Q" THEN CLS:END
460 IF C$="K" THEN 540
469 REM --READ JOYSTICK--
470 FB=STRIG(1)
480 XC=STICK(0)
490 YC=STICK(1)
500 IF FB=-1 THEN S=1 ELSE S=2
510 IF XC<XS-15 THEN X=X-1 ELSE IF XC>XS+15 THEN X=X+1
520 IF YC<YS-15 THEN Y=Y-1 ELSE IF YC>YS+15 THEN Y=Y+1
530 GOTO 570
540 FOR I=1 TO 8
550 IF K$=KT$(I) THEN X=X+XT(I):Y=Y+YT(I):I=8
560 NEXT I
570 IF X>319 THEN X=0 ELSE IF X<0 THEN X=319
580 IF Y>175 THEN Y=0 ELSE IF Y<0 THEN Y=175
590 GOTO 340
599 REM --DRAW FACE--
600 PSET(159,147),NC
610 FOR I=1/30 TO 8*ATN(1) STEP 1/30
620 LINE -(SIN(I)*50+159,COS(I)*60+87),NC
630 NEXT I
640 GOTO 350
1000 DATA 77,-1,1,44,0,1,46,1,1,74,-1,0
1010 DATA 76,1,0,85,-1,-1,73,0,-1,79,1,-1
1020 DATA 159,87,1,2

```

TI-99/4A/Portrait

```

9 REM --Make sure the ALPHA LOCK key is UP before typ
ing in or running program--
10 DIM XT(8),YT(8),JI(8),KI(8),KC(9),KB(8)
19 REM --Print instructions--
20 CALL CLEAR
30 PRINT "Do you want to use the","<k>eyboard or <j>oy
stick?"
40 CALL KEY(0,C,P)
50 IF (C<>106)*(C<>107) THEN 40
60 CALL CLEAR
70 IF C=107 THEN 100
80 PRINT TAB(4);"Please plug in your",TAB(10);"joystic
k."
90 GOTO 140
100 PRINT "Here are your drawing keys:"
110 PRINT TAB(28),TAB(10);"u i o"
120 PRINT TAB(10);"j l"
130 PRINT TAB(10);"m ."
140 PRINT TAB(28),TAB(3);"Press any key to begin."
150 CALL KEY(0,K,P)
160 IF P=0 THEN 150
170 CALL CLEAR
179 REM --In line 180, all the F's must be capitals--
180 A$="FFFFFFFFFFFFFFFF"

```

```

190 FOR I=1 TO 9
200 READ KC(I),D,E
210 CALL CHAR(KC(I),A$)
220 CALL COLOR(D,E,E)
230 NEXT I
240 FOR I=1 TO 8
250 READ XT(I),YT(I),JI(I),KI(I),KB(I)
260 NEXT I
270 RESTORE 1060
280 READ X,Y,NC,S
290 CALL CLEAR
300 CALL SCREEN(16)
310 IF C=106 THEN 340
320 PRINT "d=draw";TAB(17);"e=erase"
330 GOTO 350
340 PRINT "fire=erase";TAB(17);"stick=draw"
350 PRINT "c=change color f=draw face"
360 PRINT "s=clear screen q=quit"
369 REM --Erase and plot blocks--
370 IF S=2 THEN 390
380 CALL HCHAR(HR,HC,64)
390 CALL HCHAR(Y,X,KC(NC))
400 HC=X
410 HR=Y
419 REM --Read keyboard--
420 CALL KEY(0,K,P)
430 IF (P=0)*(C=107) THEN 420
440 IF (P=0)*(C=106) THEN 620
450 IF K<>101 THEN 480
460 S=1
470 GOTO 610
480 IF K<>100 THEN 510
490 S=2
500 GOTO 610
510 IF K=115 THEN 270
520 IF K<>99 THEN 570
530 NC=NC+1
540 IF NC<10 THEN 610
550 NC=2
560 GOTO 610
570 IF K=102 THEN 890
580 IF K<>113 THEN 610
590 CALL CLEAR
600 END
610 IF C=107 THEN 740
619 REM --Read joystick--
620 CALL JOYST(1,M,N)
630 FOR I=1 TO 8
640 IF (M<>JI(I))*(N<>KI(I)) THEN 680
650 X=X+XT(I)
660 Y=Y+YT(I)
670 I=8
680 NEXT I
690 CALL KEY(1,B,P)
700 S=2
710 IF B<>18 THEN 800
720 S=1
730 GOTO 800
740 FOR I=1 TO 8
750 IF K<>KB(I) THEN 790
760 X=X+XT(I)
770 Y=Y+YT(I)
780 I=8
790 NEXT I
800 IF X<33 THEN 820
810 X=1
820 IF X>0 THEN 840
830 X=32
840 IF Y<21 THEN 860
850 Y=1
860 IF Y>0 THEN 370
870 Y=20
880 GOTO 370
889 REM --Draw face--
890 FOR I=1/8 TO 4.1*TAN(1) STEP 1/8
900 XF=INT(SIN(I)*5.6)+16
910 YF=INT(COS(I)*7.5)+10

```


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FAMILY COMPUTING

BEGINNER PROGRAMS

```

920 CALL HCHAR(YF,XF,KC(NC))
930 NEXT I
940 CALL HCHAR(6,20,64)
950 CALL HCHAR(13,11,64)
960 CALL HCHAR(16,19,64)
970 GOTO 390
1000 DATA 64,5,16,72,6,2,80,7,5,88,8,7,144,15,11
1010 DATA 152,16,13,40,2,9,48,3,8,120,12,6
1020 DATA 0,-1,0,4,105,1,-1,4,4,111
1030 DATA 1,0,4,0,108,1,1,4,-4,46
1040 DATA 0,1,0,-4,44,-1,1,-4,-4,109
1050 DATA -1,0,-4,0,106,-1,-1,-4,4,117
1060 DATA 16,11,2,2

```

Timex Sinclair 1000 w/16K RAM Pack & Timex Sinclair 1500/Portrait

```

10 DIM K$(8,1)
20 DIM Q(8)
30 DIM R(8)
40 SLOW
49 REM --PRINT INSTRUCTIONS--
50 PRINT TAB 3;"HERE ARE YOUR DRAWING KEYS:"
60 PRINT AT 3,12;"U I O"
70 PRINT AT 4,12;"J L"
80 PRINT AT 5,12;"N M ."
90 PRINT AT 7,2;"PLEASE PRESS ANY KEY TO BEGIN."
100 IF INKEY$="" THEN GOTO 100
110 FAST
120 CLS
130 LET D$="M,0,-1,-1,-1,L,1,0,0,1,1,I,0,1,U,-1,1,J,-1,0,N,-1,-1,"
140 LET P1=1
150 LET P2=1
160 FOR I=1 TO 8
170 GOSUB 1000
180 LET K$(I, TO 1)=N$
190 GOSUB 1000
200 LET Q(I)=VAL N$
210 GOSUB 1000
220 LET R(I)=VAL N$
230 NEXT I
240 LET X=32
250 LET Y=22
260 LET S=2
270 SLOW
280 PRINT AT 19,1;"D=DRAW";AT 19,9;"E=ERASE";AT 19,18;"F=FACE";AT 19,26;"Q=QUIT";AT 20,9;"S=SCALE"
289 REM --ERASE AND PLOT PIXEL--
290 IF S=1 THEN UNPLOT HC,HR
300 PLOT X,Y
310 LET HC=X
320 LET HR=Y
339 REM --READ KEYBOARD--
330 LET C$=INKEY$
340 IF C$="" THEN GOTO 330
350 IF C$<>"S" THEN GOTO 380
360 CLS
370 GOTO 240
380 IF C$="E" THEN LET S=1
390 IF C$="D" THEN LET S=2
400 IF C$="F" THEN GOTO 530
410 IF C$="Q" THEN STOP
420 FOR I=1 TO 8
430 IF C$<>K$(I, TO 1) THEN GOTO 470
440 LET X=X+Q(I)
450 LET Y=Y+R(I)
460 LET I=8
470 NEXT I
480 IF X>63 THEN LET X=0
490 IF X<0 THEN LET X=63
500 IF Y>43 THEN LET Y=6
520 IF Y<6 THEN Y=43
510 GOTO 290
529 REM --DRAW FACE--
530 FAST

```

```

540 FOR I=1/16 TO 4.1*TAN (1) STEP 1/16
550 PLOT INT(SIN (I)*11.5+32),INT(COS (I)*14+22)
560 NEXT I
570 SLOW
580 GOTO 300
1000 IF D$(P1)="", THEN GOTO 1030
1010 LET P1=P1+1
1020 GOTO 1000
1030 LET N$=D$(P2 TO P1-1)
1040 LET P1=P1+1
1050 LET P2=P1
1060 RETURN

```

TRS-80 Color Computer w/Extended Color BASIC/Portrait

```

10 DIM K$(8),XT(8),YT(8)
20 H=1
29 REM --PRINT INSTRUCTIONS--
30 CLS
40 PRINT "DO YOU WANT TO USE THE"
50 PRINT "<K>EYBOARD OR <J>OYSTICK?"
60 C$=INKEY$
70 IF C$<>"K" AND C$<>"J" THEN 60 ELSE CLS
80 IF C$="J" THEN PRINT "PLEASE PLUG YOUR JOYSTICK INTO"
,"THE RIGHT JOYSTICK PORT.":GOTO 130
90 PRINT TAB(3);"HERE ARE YOUR DRAWING KEYS:"
100 PRINT TAB(44);"U I O"
110 PRINT TAB(12);"J L"
120 PRINT TAB(12);"M ."
130 PRINT TAB(43);"COMMANDS:"
140 IF C$="J" THEN PRINT TAB(40);"MOVE STICK TO DRAW";T
AB(40);"<FIRE> TO ERASE":GOTO 160
150 PRINT TAB(32);"D=DRAW";TAB(18);"E=ERASE"
160 PRINT "C=CHANGE COLOR";TAB(18);"F=DRAW FACE"
170 PRINT "Q=QUIT";TAB(18);"S=CLEAR SCREEN";
180 PRINT TAB(45);"H=HELP"
190 PRINT TAB(36);"PRESS ANY KEY TO ";
199 REM --ERASE AND PLOT PIXEL--
200 IF H=2 THEN PRINT "CONTINUE." ELSE PRINT "BEGIN."
210 K$=INKEY$
220 IF K$="" THEN 210 ELSE CLS
230 PMODE 3,1
240 SCREEN 1,0
250 IF H=2 THEN 330
260 FOR I=1 TO 8
270 READ K,XT(I),YT(I)
280 K$(I)=CHR$(K)
290 NEXT I
300 READ X,Y,NC,S,H
310 COLOR 1,2
320 PCLS
330 IF S=1 THEN PSET(HC,HR,2)
340 PSET(X,Y,NC)
350 HC=X
360 HR=Y
369 REM --READ KEYBOARD--
370 K$=INKEY$
380 IF K$="" THEN 470
390 IF K$="E" THEN S=1 ELSE IF K$="D" THEN S=2
400 IF K$="F" THEN 600
410 IF K$="S" THEN RESTORE:GOTO 260
420 IF K$="C" THEN NC=NC+1
430 IF NC>4 THEN NC=1
440 IF NC=2 THEN NC=3
450 IF K$="Q" THEN CLS:END
460 IF K$="H" THEN IF C$="J" THEN 130 ELSE 90
470 IF C$="K" THEN 540
479 REM --READ JOYSTICK--
480 IF PEEK(65280)=126 OR PEEK(65280)=254 THEN S=1 ELSE
S=2
490 XC=JOYSTK(0)
500 YC=JOYSTK(1)
510 IF XC<10 THEN X=X-1 ELSE IF XC>52 THEN X=X+1
520 IF YC<10 THEN Y=Y-1 ELSE IF YC>52 THEN Y=Y+1
530 GOTO 570
540 FOR I=1 TO 8

```


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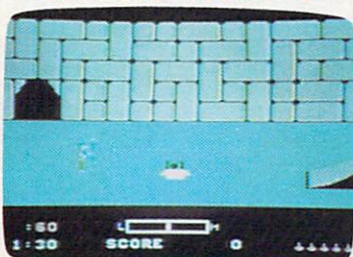


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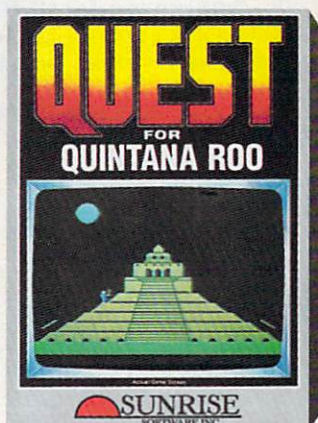
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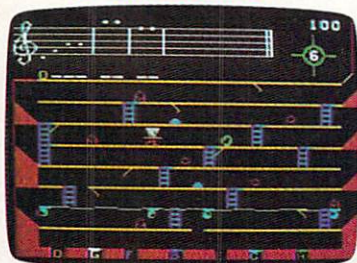
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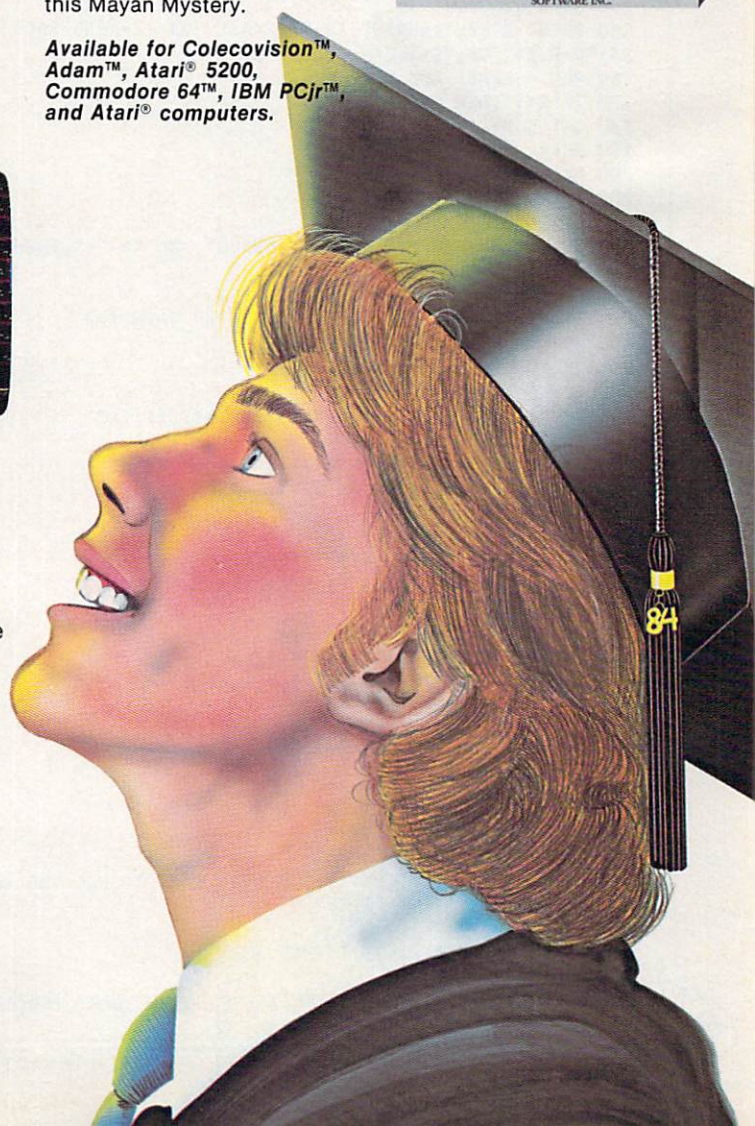
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BEGINNER PROGRAMS

```

550 IF K$=K$(I) THEN X=X+XT(I):Y=Y+YT(I):I=8
560 NEXT I
570 IF X>255 THEN X=0 ELSE IF X<0 THEN X=255
580 IF Y>191 THEN Y=0 ELSE IF Y<0 THEN Y=191
590 GOTO 330
599 REM --DRAW FACE--
600 COLOR NC
610 LINE (127,144)-(127,144),PSET
620 FOR I=1/20 TO 8*ATN(1) STEP 1/20
630 LINE -(SIN(I)*42+127,COS(I)*50+95),PSET
640 NEXT I
650 GOTO 340
1000 DATA 77,-1,1,44,0,1,46,1,1,74,-1,0
1010 DATA 76,1,0,85,-1,-1,73,0,-1,79,1,-1
1020 DATA 127,95,1,2,2

```

TRS-80 Model III/Portrait

```

10 DIM K$(8),XT(8),YT(8)
19 REM --PRINT INSTRUCTIONS--
20 CLS
30 PRINT@130,"HERE ARE YOUR DRAWING KEYS (USE THE NUME
RIC KEYPAD):"
40 PRINT@281,"7 8 9"
50 PRINT@409,"4 6"
60 PRINT@537,"1 2 3"
70 PRINT@656,"PLEASE PRESS ANY KEY TO BEGIN."
80 R$=INKEY$
90 IF R$="" THEN 80
100 CLS
110 FOR I=1 TO 8
120 READ K$(I),XT(I),YT(I)
130 NEXT I
140 READ X,Y,S
150 S$=STRING$(4,32)
160 PRINT @962,"D=DRAW";S$;"E=ERASE";S$;"F=DRAW FACE";
S$;"Q=QUIT";S$;"S=CLEAR SCREEN";
169 REM --ERASE AND PLOT PIXEL--
170 IF S=1 THEN RESET(HC,HR)
180 SET(X,Y)
190 HC=X
200 HR=Y
209 REM --READ KEYBOARD--
210 K$=INKEY$
220 IF K$="" THEN 210 ELSE IF K$>"O" AND K$<":" THEN 2
70
230 IF K$="S" THEN RESTORE:GOTO 100
240 IF K$="E" THEN S=1 ELSE IF K$="D" THEN S=2
250 IF K$="Q" THEN CLS:END
260 IF K$="F" THEN 330 ELSE 180
270 FOR I=1 TO 8
280 IF K$=K$(I) THEN X=X+XT(I):Y=Y+YT(I):I=8
290 NEXT I
300 IF X>127 THEN X=0 ELSE IF X<0 THEN X=127
310 IF Y>44 THEN Y=0 ELSE IF Y<0 THEN Y=44
320 GOTO 170
329 REM --DRAW FACE--
330 FOR I=1/30 TO 8*ATN(1) STEP 1/30
340 SET(SIN(I)*26+64,COS(I)*16+21)
350 NEXT I
360 GOTO 180
1000 DATA 2,0,1,3,1,1,6,1,0,9,1,-1
1010 DATA 8,0,-1,7,-1,-1,4,-1,0,1,-1,1
1020 DATA 64,21,2

```

VIC-20/Portrait

```

10 DIM K$(8),XT(8),YT(8)
19 REM --PRINT INSTRUCTIONS--
20 PRINT CHR$(147);CHR$(31);"DO YOU WANT TO USE THE <K
>EYBOARD OR"," <J>OYSTICK?"
30 GET C$
40 IF C$<>"K" AND C$<>"J" THEN 30
50 PRINT CHR$(147)
60 IF C$="J" THEN PRINT " PLEASE PLUG IN YOUR",TAB(6)

```

```

;"JOYSTICK.":GOTO 110
70 PRINT " THE DRAWING KEYS ARE"
80 PRINT TAB(29);"U I O"
90 PRINT TAB(7);"J L"
100 PRINT TAB(7);"M , ."
110 PRINT TAB(22);"PRESS ANY KEY TO BEGIN"
120 GET R$
130 IF R$="" THEN 120
140 PRINT CHR$(147)
150 FOR I=1 TO 8
160 READ K,XT(I),YT(I)
170 K$(I)=CHR$(K)
180 NEXT I
190 READ SM,CM,X,Y,NC,S
200 POKE 214,22
210 PRINT
220 IF C$<>"K" THEN PRINT "STICK=DRAW FIRE=ERASE";:GO
TO 240
230 PRINT "D=DRAW";TAB(14);"E=ERASE"
240 PRINT CHR$(28);"C=COLOR F=FACE Q=QUIT"
250 PRINT CHR$(144);TAB(4);"S=CLEAR SCREEN";
259 REM --ERASE AND PLOT BLOCKS--
260 IF S=1 THEN POKE CM+HC+22*HR,1:POKE SM+HC+22*HR,16
0
270 POKE CM+X+22*Y,NC
280 POKE SM+X+22*Y,160
290 HC=X
300 HR=Y
309 REM --READ KEYBOARD--
310 GET K$
320 IF K$="" THEN 410
330 IF K$="E" THEN S=1
340 IF K$="D" THEN S=2
350 IF K$="S" THEN RESTORE:GOTO 140
360 IF K$="C" THEN NC=NC+1
370 IF NC>7 THEN NC=0
380 IF NC=1 THEN NC=2
390 IF K$="F" THEN 580
400 IF K$="Q" THEN PRINT CHR$(147):END
410 IF C$="K" THEN 500
419 REM --READ JOYSTICK--
420 POKE 37154,127
430 RT=PEEK(37152) AND 128
440 POKE 37154,255
450 JY=PEEK(37137)
460 X=X+SGN(JY AND 16)-SGN(RT)
470 Y=Y+SGN(JY AND 8)+SGN(JY AND 4)
480 S=1+SGN(JY AND 32)
490 GOTO 530
500 FOR I=1 TO 8
510 IF K$=K$(I) THEN X=X+XT(I):Y=Y+YT(I):I=8
520 NEXT I
530 IF X>21 THEN X=0
540 IF X<0 THEN X=21
550 IF Y>19 THEN Y=0
560 IF Y<0 THEN Y=19
570 GOTO 260
579 REM --DRAW FACE--
580 FOR I=1/8 TO 4*ATAN(1) STEP 1/8
590 XF$=SIN(I)*5.5+10
600 YF$=COS(I)*7+11
610 POKE CM+XF$+22*YF$,NC
620 POKE SM+XF$+22*YF$,160
630 NEXT I
640 POKE CM+6+22*15,1
650 POKE SM+6+22*15,160
660 GOTO 270
1000 DATA 77,-1,1,44,0,1,46,1,1,74,-1,0
1010 DATA 76,1,0,85,-1,-1,73,0,-1,79,1,-1
1020 DATA 7680,38400,10,11,5,2

```




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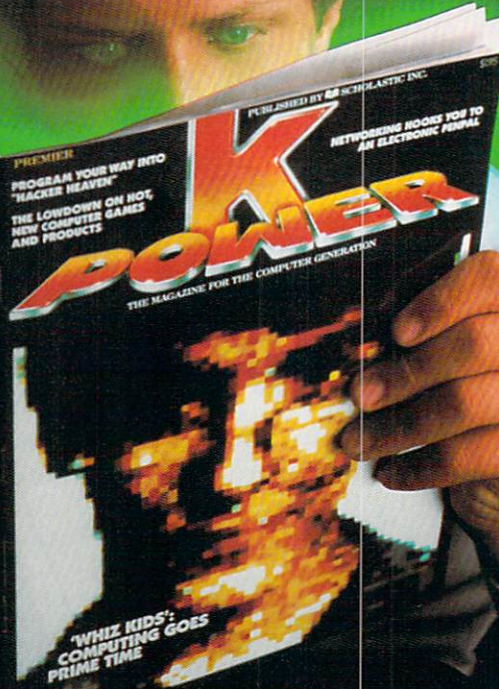
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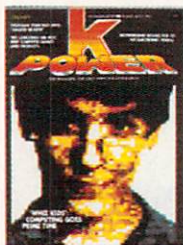


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BEDTIME STORIES A New Twist On An Old Pastime

BY ED GRAHAM III

From age 4 until age 7, I could not go to sleep without my father sitting on the edge of my bed and telling me a helicopter rescue story.

As I lay in bed, I would stare up into the darkness of the mattress of the upper bunk. That darkness was my mind's CRT. Everything my father said was visualized in vivid colors.

Now, years later, I am a father myself. When our family purchased a TI-99/4A, I knew I wanted to

write a program for my kids. I had a driving force within me: I wanted to pass along something that my father had given me a long time ago—a window to creative thinking. So I started to write my *Helicopter Game*.

Now, at night, just before bedtime, I watch silently as my kids play my game. I watch their faces, not the computer screen. Every time they move the helicopter off the launchpad, I see a different type of determination on their faces. They have decided upon a mission: the rescue of a little boy or a little girl. Their minds are working

ED GRAHAM III, 31, is an assistant manager for Seabek Products, Inc. He and his wife, Lynda, live in Houston, Texas, with their four kids.



Ed, in front of scenes from Texas' past, which his sister, Pam, painted.

and their eyes are peering into the screen looking for unexpected dangers, just as I watched for them in the darkness of the mattress of the top bunk.

HOW TO PLAY

Helicopter Game can be played with a joystick or using the keyboard. When using the keyboard, press "E" for up; "X" for down; "S" for left; and "D" for right. To halt your flight, press the ENTER key.

(When using a joystick, press the fire button.)

The object of the game is to leave the launchpad, fly left, reenter the screen on the right, and return to the launchpad in as short a time as possible. Time elapsed is recorded in the lower right-hand corner. Do not crash into the sun, the hot-air balloons, your launchpad, or the screen's top and bottom borders. There are three levels of difficulty to choose from.

PHOTOGRAPH BY EDWARD GRAHAM, JR.

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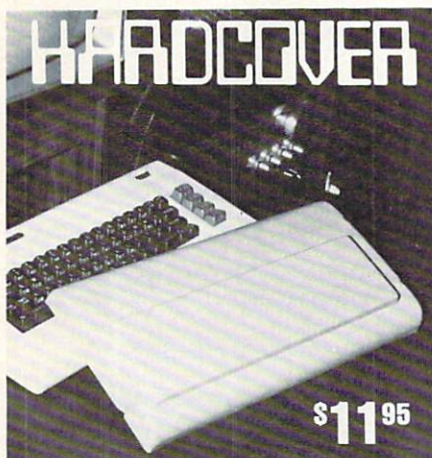
9 REM DEPRESS <ALPHA LOCK> BEFORE TYPING THE PROGRAM
10 CALL CLEAR :: RANDOMIZE
20 AS=RPT$("0",16):: BS=RPT$("10",8)
30 CALL CHAR(96,"000000FE10101010385C7F7C384482"&AS&BS"00808F80808000")
40 CALL CHAR(100,BS&AS&AS&AS)
50 CALL CHAR(104,"030F1F1F3F3F3F3F1F1F0F030A0A0403C0F0F8F8FCFCFCFCF8F8F0C0505020C0")
60 CALL CHAR(108,"3C7EFFFFFFF7E3C"&AS&AS&AS)
70 PRINT :: PRINT "GOOD LUCK!" :: PRINT "PRESS ANY KEY TO CONTINUE." :: BS=1E99
80 CALL KEY(0,K,S):: IF S=0 THEN 80
90 CALL CLEAR :: DISPLAY AT(12,1):"CHOOSE A DIFFICULTY LEVEL" :: DISPLAY AT(14,12):"(1-3)"
100 DISPLAY AT(17,1):"(1) BEGINNER" :: DISPLAY AT(18,1):"(2) FAIR" :: DISPLAY AT(19,1):"(3) ADVANCED"
110 CALL KEY(0,K,S):: IF S=0 OR K<49 OR K>51 THEN 110 ELSE LVL=K-48
120 INPUT "PRESS <ENTER> WHEN READY.":RS
130 CALL SCREEN(5):: CALL MAGNIFY(4)
140 CALL CLEAR :: CALL HCHAR(1,1,95,32):: CALL HCHAR(2,3,1,95,32)
150 B=INT(RND*200)+1 :: C=INT(RND*15)+1
160 CALL SPRITE(#9,108,10,64,B,0,C)
170 FOR Z=1 TO 8 :: READ A,B,C,D :: CALL SPRITE(#Z,A,B,C,D):: NEXT Z
180 J=INT(RND*8)-4 :: FOR Q=4 TO 8 :: CALL MOTION(#Q,0,J):: NEXT Q
190 CALL KEY(0,Q,A):: IF A=0 THEN 250
200 IF Q=101 OR Q=69 THEN X=X-LVL
210 IF Q=115 OR Q=83 THEN Y=Y-LVL
220 IF Q=120 OR Q=88 THEN X=X+LVL
230 IF Q=100 OR Q=68 THEN Y=Y+LVL
240 IF Q=13 THEN X,Y=0

```

```

250 CALL MOTION(#1,X,Y):: CALL COINC(ALL,Z):: IF Z=-1 THEN 330
260 CALL POSITION(#1,J,K):: IF J<10 OR J>154 THEN 330 :: IF K<16 THEN FLAG=1
270 CALL COINC(#1,156,180,4,PAD):: IF FLAG=1 AND PAD=-1 THEN 300
280 SCORE=SCORE+1 :: DISPLAY AT(24,24):SCORE
290 GOTO 190
300 CALL MOTION(#1,0,0):: IF SCORE<BS THEN BS=SCORE
310 CALL SOUND(4250,110,1,440,1,880,1):: CALL HCHAR(1,1,32,32):: DISPLAY AT(1,7):"CONGRATULATIONS!" :: DISPL AY AT(2,7):"YOUR SCORE: ";SCORE
320 DISPLAY AT(4,7):"BEST SCORE: ";BS :: GOTO 360
330 CALL MOTION(#1,0,0):: CALL COLOR(#1,16)
340 CALL SOUND(4250,-5,1):: DISPLAY AT(11,10):"C R A S H"
350 FOR DEL=1 TO 900 :: NEXT DEL :: CALL DELSPRITE(#1) :: DISPLAY AT(12,5):"YOU ARE VAPORIZED ..."
360 FOR DEL=1 TO 500 :: NEXT DEL
370 DISPLAY AT(24,1)BEEP:"PLAY AGAIN? (Y OR N)"
380 ACCEPT AT(24,22):XS
390 CALL DELSPRITE(ALL):: IF XS=CHR$(110)THEN.450
400 CALL CLEAR :: RESTORE :: X,Y,SCORE,FLAG=0
410 DISPLAY AT(10,2):"DO YOU WANT TO PLAY AT THE" :: D ISPLAY AT(11,1)BEEP:"SAME SKILL LEVEL? (Y OR N)"
420 ACCEPT AT(11,28):XS
430 IF XS=CHR$(121)THEN 140 ELSE 90
440 IMAGE YOUR BEST SCORE WAS ###.
450 DISPLAY AT(10,1)ERASE ALL BEEP:"I ENJOYED OUR TIME TOGETHER." :: IF BS<>1E99 THEN DISPLAY AT(12,3):USING 440:BS
460 DISPLAY AT(14,9):"HAPPY FLYING!"
470 END
1000 DATA 96,2,153,180,100,2,160,164,100,2,160,204
1010 DATA 104,3,120,110,104,7,30,45,104,2,110,195
1020 DATA 104,16,100,20,104,12,20,220

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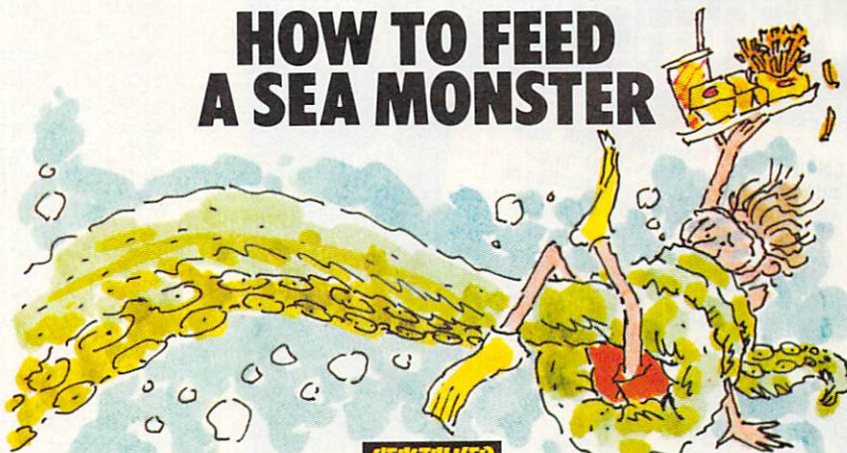
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READER-WRITTEN PROGRAMS

TI-99/4A w/TI Extended BASIC/Helicopter Game (joystick version)

```

9 REM RELEASE <ALPHA LOCK> AFTER TYPING THE PROGRAM.
10 CALL CLEAR :: RANDOMIZE
20 AS=RPTS("0",16):: BS=RPTS("10",8)
30 CALL CHAR(96,"000000FE10101010385C7F7C384482"&AS&"000808F0808000")
40 CALL CHAR(100,BS&AS&AS&AS)
50 CALL CHAR(104,"030F1F1F3F3F3F3F1F1F0F030A0A0403C0F0F8F8FCFCFCFCF8F8F0C0505020C0")
60 CALL CHAR(108,"3C7EFFFFFFF7E3C"&AS&AS&AS)
70 PRINT :: PRINT "GOOD LUCK!" :: PRINT "PRESS ANY KEY TO CONTINUE." :: BS=1E99
80 CALL KEY(0,K,S):: IF S=0 THEN 80
90 CALL CLEAR :: DISPLAY AT(12,1):"CHOOSE A DIFFICULTY LEVEL" :: DISPLAY AT(14,12):"(1-3)"
100 DISPLAY AT(17,1):"(1) BEGINNER" :: DISPLAY AT(18,1):"(2) FAIR" :: DISPLAY AT(19,1):"(3) ADVANCED"
110 CALL KEY(0,K,S):: IF S=0 OR K<49 OR K>51 THEN 110 ELSE LVL=K-48
120 INPUT "PRESS <ENTER> WHEN READY.":RS
130 CALL SCREEN(5):: CALL MAGNIFY(4)
140 CALL CLEAR :: CALL HCHAR(1,1,95,32):: CALL HCHAR(2,3,1,95,32)
150 B=INT(RND*200)+1 :: C=INT(RND*15)+1
160 CALL SPRITE(#9,108,10,64,B,0,C)
170 FOR Z=1 TO 8 :: READ A,B,C,D :: CALL SPRITE(#Z,A,B,C,D):: NEXT Z
180 J=INT(RND*8)-4 :: FOR Q=4 TO 8 :: CALL MOTION(#Q,0,J):: NEXT Q
190 CALL JOYST(1,U,V)
200 X=X-SGN(V)*LVL
210 Y=Y+SGN(U)*LVL
220 CALL KEY(1,K,S):: IF S<>0 THEN X,Y=0
230 CALL MOTION(#1,X,Y):: CALL COINC(ALL,Z):: IF Z=-1 THEN 310
240 CALL POSITION(#1,J,K):: IF J<10 OR J>154 THEN 310 :: IF K<16 THEN FLAG=1
250 CALL COINC(#1,156,180,4,PAD):: IF FLAG=1 AND PAD=-1 THEN 280
260 SCORE=SCORE+1 :: DISPLAY AT(24,24):SCORE
270 GOTO 190
280 CALL MOTION(#1,0,0):: IF SCORE<BS THEN BS=SCORE
290 CALL SOUND(4250,110,1,440,1,880,1):: CALL HCHAR(1,1,32,32):: DISPLAY AT(1,7):"CONGRATULATIONS!" :: DISPLAY AT(2,7):"YOUR SCORE: ";SCORE
300 DISPLAY AT(4,7):"BEST SCORE: ";BS :: GOTO 340
310 CALL MOTION(#1,0,0):: CALL COLOR(#1,16)
320 CALL SOUND(4250,-5,1):: DISPLAY AT(11,10):"C R A S H"
330 FOR DEL=1 TO 900 :: NEXT DEL :: CALL DELSPRITE(#1) :: DISPLAY AT(12,5):"YOU ARE VAPORIZED ..."
340 FOR DEL=1 TO 500 :: NEXT DEL
350 DISPLAY AT(24,1)BEEP:"PLAY AGAIN? (Y OR N)"
360 ACCEPT AT(24,22):XS
370 CALL DELSPRITE(ALL):: IF XS=CHR$(110)THEN 430
380 CALL CLEAR :: RESTORE :: X,Y,SCORE,FLAG=0
390 DISPLAY AT(10,2):"DO YOU WANT TO PLAY AT THE" :: DISPLAY AT(11,1)BEEP:"SAME SKILL LEVEL? (Y OR N)"
400 ACCEPT AT(11,28):XS
410 IF XS=CHR$(121)THEN 140 ELSE 90
420 IMAGE YOUR BEST SCORE WAS ###.
430 DISPLAY AT(10,1)ERASE ALL BEEP:"I ENJOYED OUR TIME TOGETHER." :: IF BS<1E99 THEN DISPLAY AT(12,3):USING 420:BS
440 DISPLAY AT(14,9):"HAPPY FLYING!"
450 END
1000 DATA 96,2,153,180,100,2,160,164,100,2,160,204
1010 DATA 104,3,120,110,104,7,30,45,104,2,110,195
1020 DATA 104,16,100,20,104,12,20,220

```


PROGRAMMING P.S.

Corrections to previous months' programs—
and enhancements suggested by our readers

CORRECTIONS...

TRS-80 Color Computer w/Extended Color BASIC/ Biorhythms (May, pages 88-89)

This program is incorrect because of errors that occurred in the editing. The program treats every 100th year, for example, as having 365 days, but the year 2000 (and every other year that is evenly divisible by 400) will be a leap year. To correct these problems, add line 545

545 NEXT X

and change lines 210, 350-390, 540, 550, 570-590, 610, and 650 to read as follows:

```
210 L1=ABS(D(3)/4=INT(D(3)/4) AND (D(3)/100<>INT(D(3)/100) OR D(3)/400=INT(D(3)/400)):IF L1=0 AND LF=1 THEN
PRINT "NOT A LEAP YEAR!":SOUND 200,1:PRINT:LF=0:GOTO 110
350 LY=ABS(D(4))>2 AND (D(5)/4=INT(D(5)/4) AND D(5)/10<>INT(D(5)/100) OR D(5)/400=INT(D(5)/400))
360 FOR J=0 TO (M(D(4))+LY*ABS(D(4)=2))*8 STEP 8
370 LINE (J,15)-(J,175),PSET
380 NEXT J
390 LINE (0,96)-((M(D(4))+LY*ABS(D(4)=2))*8,96),PSET
540 FOR X=D(3) TO D(5)-1:IF X/4=INT(X/4) AND (X/100<>INT(X/100) OR X/400=INT(X/400)) THEN J=J+1
550 IF D(1)=1 THEN 570 ELSE FOR X=1 TO D(1)-1
570 J=J-D(2)+1
580 IF D(1)>2 THEN J=J-L1
590 IF D(4)=1 THEN 610 ELSE FOR X=1 TO D(4)-1
610 IF D(4)>2 THEN J=J+LY
650 FOR X=0 TO 8*((M(D(4))+LY*ABS(D(4)=2)))
```

We apologize to the program's author and to our readers.

VIC-20/Phone Cost Monitor (May, pages 72, 74)

Due to a printer's error, one letter in line 730 was illegible. The line should read as follows:

```
730 IF FL = 0 AND MIN >= BG AND SEC = 1 THEN CO = CO+A
T
```

...AND ENHANCEMENTS

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TIPS TO THE TYPIST

1. When you type program lines into your computer, be sure to copy them *exactly* as written. Numbers, punctuation marks, and spaces are very important!
2. Remember to press RETURN or ENTER *after* every completed program line.
3. Run the program when you finish typing it in by typing RUN and pressing the RETURN or ENTER key. If the computer gives you an error message, don't panic. Mistakes can be fixed. List the program by typing the word LIST and

- pressing the RETURN or ENTER key and double-check each line. A foolproof way to correct a mistake is to type in the entire line again (including its line number). When you list the program again, you should find the new line in place of the old.
4. If you need more help, read the programming guide written for your computer. It will answer questions that can't possibly be covered here.
5. When all else fails . . . turn off the computer and relax.

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HAPPY BIRTHDAY AMERICA

Celebrating The 4th With Your IBM

BY DENISE NELSON

When I was growing up, the 4th of July was always my second favorite holiday—after Christmas. At dusk our family would pile into our beige Rambler and drive to the junior high school in the center of Rockland, Massachusetts, where the town celebration took place.

While we waited for the fireworks to begin, our parents would sit on lawn chairs and talk as we kids rolled down a big, grassy hill—the same hill we'd sled down in the winter. At the sound of the first firework, we'd lie on the grass and stare up at the sky. By then it was way past our bedtime and we'd try hard to stay awake!

Our town didn't have just ordinary go-up-there-and-explode-type fireworks. They had fireworks that made things. My favorite was the one that formed a flag in the sky.

DENISE NELSON, 31, uses the family IBM PC every day for either programming or word-processing purposes. She plans to take programming classes in the near future, and eventually to market her own educational programs. The Nelsons have recently relocated to a naval base in San Diego, California.



Denise, with the old family flag she and her husband bought 13 years ago when they were first married.

A DIFFERENT CELEBRATION

Now that I'm the wife of a navy officer, I don't always get to see fireworks on the 4th of July. It depends on the base where we are stationed. But this year I can again watch the formation of a flag, not in the sky but on the screen of our IBM PC computer. My program, *Happy Birthday America*, draws a 1776 American flag.

And on the morning of the 4th, after our family tradition of hoisting a flag and saying the Pledge of Allegiance, our computer can lead us in singing "You're a Grand Old Flag," along with six other patriotic tunes that I've included in my program. To select a song, press a letter next to any one of the seven abbreviated song titles on the screen.

IBM PC w/Color Graphics Adapter & Advanced BASIC & PCjr w/Cartridge BASIC/Happy Birthday America

```

10 DEFINT A-Z:DIM M$(7):WIDTH 40:SCREEN 0,1:COLOR 15,0
,0:KEY OFF:CLS
20 FOR X=1 TO 7:READ M$(X):NEXT X
30 LOCATE 1,10,0:PRINT "HAPPY BIRTHDAY AMERICA"
39 REM ***DRAW FLAG***
40 COLOR 1:FOR I=3 TO 9:LOCATE I,5:PRINT STRING$(13,21
9):NEXT I
50 A=12:C=3:V=0
60 FOR X=3 TO 15:IF X=10 THEN V=13
70 COLOR A:A=A+C:C=-C
80 LOCATE X,18-V
90 PRINT STRING$(V+19,219)
100 NEXT X
110 COLOR 15,1:LOCATE 3,10:PRINT "*" *:LOCATE 4,9:PRIN
T "*" *
120 LOCATE 5,8:PRINT "*" *:LOCATE 6,8:PRINT "*" 7 6
*"
130 LOCATE 7,8:PRINT "*" *:LOCATE 8,9:PRINT "*" *
*:LOCATE 9,11:PRINT "*"
139 REM ***PRINT MENU***
140 COLOR 15,0,0
150 LOCATE 17,2:PRINT "      --- selections ---"
160 LOCATE 18,5:PRINT "A-YANKEE      D-BEAUTIFUL G-STAR"
170 LOCATE 19,5:PRINT "B-GRAND      E-MARINES' H-EXIT"
180 LOCATE 20,5:PRINT "C-AMERICA      F-BATTLE"
190 LOCATE 22,11:PRINT "Make your selection"
200 LOCATE 23,3:PRINT "by pressing the appropriate LET
TER."
209 REM ***ASSIGN INPUT VALUES***
210 Z$=INKEY$:IF Z$="" THEN 210
220 Z=ASC(Z$):IF Z>96 AND Z<106 THEN Z=Z-32
230 IF Z<65 OR Z>72 THEN 210 ELSE Z=Z-64
240 IF Z<8 THEN PLAY M$(Z):GOTO 210
250 CLS:LOCATE 12,2:PRINT "HAVE A SAFE AND HAPPY FOURT
H OF JULY":LOCATE 23
260 END
999 REM ***MUSIC: THE YANKEE DOODLE BOY***
1000 DATA T24003L2E.L4DDC02B03CD102A2.03L4DD2.ED02BAG0
3C1.P4EL2EEL4C#DEGL2FED1L4ED2C02A03C2ED1.P4DE2.DDC02B0
3CL1D02A03D2.L4ED02BAG03C1P1CCDECD02G03CCDEL2C02GA403
D02L4AB03CD02B03C1
1009 REM ***MUSIC: YOU'RE A GRAND OLD FLAG***
1010 DATA T25003L4GEL2CCC02L4AG03CD202B03C202AG03C202A
G03C202AGB1P2GAL2B03CD.02G403CDE.L4CD2CDE2CD1P2L4GEL2
CCC02L4AG03CD202B03C202BB-A203C#E02L2A03ED1P202L4GG03C
2.02B03L2CED.C#4D02L4BGA03C202A03L2C02B03C1.
1019 REM ***MUSIC: AMERICA (MY COUNTRY 'TIS OF THEE)**
*
1020 DATA T11002L4GGAF#.G8ABB03C02B.A8GAGF#G2.03DDDD.C
802B03CCCC.02B8AB03L8C02BAGL4B.03C8DL8EC02L4BAG2.
1029 REM ***MUSIC: AMERICA THE BEAUTIFUL***
1030 DATA T12003L4CC.02A8A03CC.02G8GAB-03CDEC2.CC.02A8
A03CC.02G8G03GF#GADG2.CA.A8GFF.E8EFGEDCF2.FF.D8DFF.C8C
CDFCGF2.
1039 REM ***MUSIC: THE MARINES' HYMN***
1040 DATA T12002L8GB03L4DDDD.G8D02L8B03CL4DDC02AG2.L8
GB03L4DDDD.G8D02L8B03CL4DDC02AL2G.03L8GF#L4ECECD.E8DL
8GF#L4ECEGD2.02L8GB03L4DDDD.G8D02L8B03CL4DDC02AG2.
1049 REM ***MUSIC: THE BATTLE HYMN OF THE REPUBLIC***
1050 DATA T16003L4CCCC02B-A03CFGAAAG2FEDDDFEFFDC02A
03C2CCCC02B-A03CFGAAAGL2FFGGFEF1P1C.02L4B-A03CFGL1AFD
2.L4EFEFDL1C02A03C2.02L4B-A03CFGA1L2FFGGFEF1.
1059 REM ***MUSIC: THE STAR-SPANGLED BANNER***
1060 DATA T10003L8C02AL4FA03CF2L8AGL4F02AB03C2L8CCA4.G
F4E2DEL4FFC02AF03L8C02AL4FA03CF2L8AGL4F02AB03C2L8CCA4.
GF4E2DEL4FFC02AF03L8AAL4AB-04CC203L8B-AL4GAB-B-2B-A.G8
FE2L8DEL4F02AB03C203CFFL8FEL4DDGL8B-AGFL4FEL8CCF4.GAB
-04C203FGA4.B-G4F2.

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WHAT'S IN STORE SOFTWARE GUIDE

QUICK TAKES ON SOFTWARE— NEW AND NOTEWORTHY

Welcome to FAMILY COMPUTING's Software Guide, the most comprehensive listing available of two dozen of the newest, most noteworthy and/or best programs on the market. Our reviewers include families from all over the country who have judged the software according to the following criteria: long-term benefits and applications, adaptability, and advantages of using a computer for a given task. Programs have been evaluated and rated for their performance in each of the categories listed below. More detailed reviews follow the chart.

Here's a rundown of the rating categories and what they mean: **O** = Overall performance, given the limitations and capacities of the particular computer for which the software is intended. **D** = Documentation, or the instructions and literature that accompany a program. **EH** = Error-handling, the software's capacity to accommodate errors made by the user—an especially important consideration with software for younger users. **GQ** = Graphics quality, also evaluated in light of each particular brand's graphics capabilities. **EU** = Ease of use after the initial learning period, which varies from computer to computer. **V** = Value for money, or how the software measures up to its price.

HOME BUSINESS/HOME MANAGEMENT

Title Manufacturer Price	Brief description	Hardware/ Equipment required	Backup policy	Ratings					
				O	D	EH	GQ	EU	V
ELECTRIC WEBSTER Cornucopia Software P.O. Box 6111 Albany, CA 94706 (415) 524-8098 \$89.95 ©1982 (Additional options cost extra.) \$209.95 (IBM version, includes all extra features.)	Spelling checker proofreads correspondence, papers, and other documents using 50,000- word dictionary as well as file of words or expressions you add yourself. Additional options check for style and grammar, and hyphenation, or automatically correct texts. —KRENGEL	Reviewed on TRS-80 Models I/III/4, 64K (disk). Also for IBM PC, 64K (disk).	Defective disks replaced free; user makes backup copy.	★ ★ ★	★ ★ ★	★ ★ ★	N/A	A	★ ★ ★
LE SCRIPT Anitek Software Products P.O. Box 361136 Melbourne, FL 32936 (305) 259-9397 \$129.95 ©1983	Write and edit newsletters, term papers, and other documents with difficult-to-learn, but easy- to use word processor, best suited for heavy-duty, serious use.† —KRENGEL	TRS-80 Models I/III/4, 48K (disk).	Defective disks replaced free w/in 30 days; \$10 fee thereafter; user makes backup copy.	★ ★ ★	★ ★ ★	★ ★ ★	N/A	A	★ ★ ★
MICROFILER Microbits Peripheral Products, Inc. 225 W. Third St. Albany, OR 97321 (503) 967-9075 \$49.95 ©1984	Small, electronic file system conveniently stores recipes, mailing lists, inventories. Helps keep track of hobbies, collections, etc. Simulates 3 × 5-in. file-card box.† —MCCARTNEY	Atari 400/800/XL series, 16K (cartridge). Cassette or disk drive required for storing data.	Defective cartridges replaced free w/in 90 days; user makes backup copy.	★ ★ ★	★ ★ ★	★ ★ ★	N/A	E	★ ★ ★
PERSONAL PAYABLES Sundex Software Corp. 4755 Walnut St. Boulder, CO 80301 (303) 440-3600 \$49.95 (IBM PC/PCjr) \$34.95 (C 64) ©1983	Many-featured checkbook program maintains up to 10 separate accounts, prints out checks and account status reports, keeps file of regularly written checks. —CHRISTIAN	Reviewed on IBM PC/ PCjr, 128K (disk). Also for Commodore 64 (disk). Version planned for Apple.	Defective disks replaced free w/in 90 days; \$15 fee thereafter or if user-damaged; user makes backup copy.	★ ★ ★	★ ★ ★	★ ★ ★	N/A	A	★ ★ ★
SPEED FILE Bluebush Inc. 3379 St. Mary's Place Santa Clara, CA 95051 (800) 241-1994 \$125 ©1983	Extremely fast, easy-to-learn, convenient information-filing system stores records and indexes them so you can instantly retrieve information by typing any word or code you've entered.† —WILSON	Apple II/II plus/IIe, 48K (disk). Version planned for IBM PC/PCjr.	Defective or user-damaged disks replaced free w/in 60 days; \$10 fee thereafter; backup copy included.	★ ★ ★	★ ★ ★	★ ★ ★	N/A	E	★ ★ ★

RATINGS KEY **O** Overall performance; **D** Documentation; **EH** Error-handling; **GQ** Graphics quality; **EU** Ease of use; **V** Value for money; ★ Poor; ★★ Average; ★★★ Good; ★★★★★ Excellent; N/A Not applicable; E Easy; A Average; D Difficult; † Longer review follows chart

SOFTWARE GUIDE

EDUCATION/FUN LEARNING

Title Manufacturer Price	Brief description	Hardware/ Equipment required	Backup policy	Ratings						
				O	D	EH	GQ	EU	V	
ALF IN THE COLOR CAVES Spinnaker Software Corp. 1 Kendall Square Cambridge, MA 02139 (617) 494-1200 \$39.95 ©1984	Colorful graphics and easy play system make this appealing to kids 3-6, who use a joystick to help a small creature through a series of tunnels. Single scenario makes it unlikely to sustain long-term interest. —AKER	Commodore 64 (cartridge). Version planned for Atari. Joystick required.	Defective cartridges replaced free w/in 30 days; \$5 fee thereafter or if user-damaged; \$12 fee for backup copy.	★ ★ ★	★ ★ ★	★ ★ ★	★ ★ ★	E	★	★
THE FACTORY Sunburst Education 39 Washington Ave. Pleasantville, NY 10570 (800) 431-6616 \$39.95 ©1983	Arrange machines on an assembly line and manufacture objects with different colors and patterns. Program most appropriate for kids ages 7-12. Encourages reasoning and inference. —MORRIS	Reviewed on Apple II/II plus/Ile/Ilc. 48K (disk). Also for Atari 400/800/XL series, 48K (disk); Commodore 64 (disk); TRS-80 Color Computer, 32K (disk).	Defective or user-damaged disks replaced free w/in 90 days; \$10 fee thereafter or for backup copy.	★ ★ ★	★ ★ ★	★ ★ ★	★ ★ ★	E	★	★
THE HINKY-PINKY GAME The 22nd Ave. Wordshop P.O. Box 3425 Eugene, OR 97403 (503) 345-6498 \$30 ©1983	Rhyming skills and vocabulary practice are key in this fun word game. Figure out rhyming phrases to describe certain words using preprogrammed expressions or those you create yourself. A fun "brain drain" for ages 9+ .† —MORRIS	Apple II/II plus/Ile. 48K (disk).	Defective disks replaced free; user makes backup copy.	★ ★ ★	★ ★ ★	★ ★ ★	N/A	A	★	★
KIDWRITER Spinnaker Software Corp. 1 Kendall Square Cambridge, MA 02139 (617) 494-1200 \$34.95 ©1984	Kids ages 6+ write, save (but can't print) stories, and illustrate them using set of adjustable shapes. Package encourages creativity and creative writing.† —BYRNE	Reviewed on Commodore 64 (disk). Also for Apple II/II plus/Ile. 48K (disk).	Defective disks replaced free w/in 30 days; \$12 fee if user-damaged or for backup copy.	★ ★ ★	★ ★ ★	★ ★ ★	★ ★ ★	A	★	★
MICROZINE, Vol. 1, No. 3 Scholastic Wizware 730 Broadway New York, NY 10003 (212) 505-3000 \$39.95 ©1983	Program robots with a simple language (like Logo), browse through a file of books, play an action/arcade game, and solve a mystery in magazine on a disk. For kids ages 10+ .† —MORRIS	Apple II w/Applesoft/II plus/Ile/Ilc. 48K (disk).	Defective disks replaced free w/in 60 days; \$10 fee for 10 months thereafter.	★ ★ ★	★ ★ ★	★ ★ ★	★ ★ ★	E	★	★
THE MONTANA READING PROGRAM Program Design, Inc. 95 East Putnam Ave. Greenwich, CT 06830 (203) 661-8799 \$36.95 (disk) \$34.95 (cassette) ©1983	Straightforward word program drills children in preprimary to second grade levels in spelling of 220 frequently used words. May require special parental encouragement for continued use. —LAMB	Atari 400/800/XL series, 32K (disk or cassette).	Defective materials replaced free w/in 90 days; \$10 fee if user-damaged or for backup copy.	★ ★ ★	★ ★ ★	★ ★ ★	★ ★ ★	E	★	★
PUZZLE MANIA Reader's Digest Software Pleasantville, NY 10570 (800) 431-8800 \$39.95 ©1984	Fill in missing pieces of one of many preprogrammed puzzles or those you make or modify yourself. Varying levels of difficulty will interest puzzle appreciators ages 8+ . —BUMGARNER	Reviewed on Apple II/II plus/Ile. 48K (disk). Also for Commodore 64 (disk) and IBM PC/PCjr. 48K (disk).	Defective disks replaced free w/in 90 days; \$15 fee thereafter, if user-damaged, or for backup copy.	★ ★ ★	★ ★ ★	★ ★ ★	★ ★ ★	A	★	★
TURTLE TOYLAND JR. HesWare 150 N. Hill Drive Brisbane, CA 94005 (800) 227-6703 \$34.95 ©1983	A unique experience in which children ages 6+ , with adult help, use a joystick-controlled graphics- and music-oriented computer language to make and animate simple pictures. † —BYRNE	Commodore 64 (disk). Joystick required. Versions planned for Apple and IBM.	Defective disks replaced free w/in 6 months; \$10 fee if user-damaged or for backup copy.	★ ★ ★	★ ★ ★	★ ★ ★	★ ★ ★	D	★	★
WEATHER COMMAND Educational Audio Visual Inc. 17 Marble Ave. Pleasantville, NY 10570 (914) 769-6332 \$40 ©1983	You have a few days to improve weather conditions in preparation for the arrival of alien ambassadors. Game teaches weather principles to children ages 12+ .† —MORRIS	Apple II/II plus/Ile 48K (disk).	Defective disks replaced free w/in 90 days; \$7.50 fee for backup copy.	★ ★ ★	★ ★ ★	★ ★ ★	★ ★ ★	A	★	★

RATINGS KEY O Overall performance; D Documentation; EH Error-handling; GQ Graphics quality; EU Ease of use; V Value for money; ★ Poor; ★★ Average; ★★★ Good; ★★★ Excellent; N/A Not applicable; E Easy; A Average; D Difficult; † Longer review follows chart

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GAMES

Title Manufacturer Price	Brief description	Hardware/ Equipment required	Backup policy	Ratings						
				O	D	EH	GQ	EU	V	
AZTEC Datamost Inc. 2660 Nordhoff Place Chatsworth, CA 91311 (818) 709-1202 \$39.95 ©1982	Crawl, jump, and climb through perilous depths of mysterious pyramid, searching for a valuable idol in exciting action-adventure game for ages 10+.† —DELSON	Reviewed on Apple II/II plus/Ile, 48K (disk). Also for Commodore 64 (disk). Version planned for Atari.	Defective disks replaced free; \$5 fee if user-damaged or for backup copy.	★ ★ ★	★ ★ ★	★ ★ ★	★ ★ ★	D	★ ★ ★	
B.C.'S QUEST FOR TIRES Sierra On-Line Sierra On-Line Bldg. Coarsegold, CA 93614 (209) 683-6858 \$34.95 (disk) \$39.95 (cartridge) ©1983	Johnny Hart's comic strip comes to life in delightful, animated arcade game. Help Thor rescue Cute Chick by steering him over, under, around, and through obstacles in his path. Great for kids ages 8+. —DELSON	Reviewed on Atari 400/800/XL series, 32K (disk), 16K (cartridge). Also for Apple II/II plus/Ile, 48K (disk); Commodore 64 (disk or cartridge); Coleco ADAM (cartridge). Version planned for IBM.	Defective disks replaced free w/in 90 days; \$5 fee thereafter or if user-damaged.	★ ★ ★	★ ★ ★	★ ★ ★	★ ★ ★	A	★ ★ ★	
MURDER ON THE ZINDERNEUF Electronic Arts 2755 Campus Drive San Mateo, CA 94403 (415) 571-7171 \$40 ©1983	Challenging mystery adventure calls upon your deductive powers to gather evidence and uncover the culprit of a murder aboard a dirigible. For ages 12+, 8+ with adult help.† —DELSON	Reviewed on Atari 400/800/XL series, 48K (disk). Also for Commodore 64 (disk). Versions planned for Apple and IBM. Joystick required.	Defective disks replaced free within 90 days; \$7.50 fee thereafter or if user-damaged.	★ ★ ★	★ ★ ★	★ ★ ★	★ ★ ★	A	★ ★ ★	
OPERATION WHIRLWIND Broderbund Software 17 Paul Drive San Rafael, CA 94903 (415) 479-1170 \$39.95 ©1983	Command a battalion of tanks, infantry, artillery, and assorted vehicles in colorful strategy/war game featuring four levels of difficulty and realistic play action.† —DELSON	Reviewed on Atari 400/800/XL series, 48K (disk). Version planned for Commodore 64. Joystick required.	Defective disks replaced free; \$5 fee if user-damaged.	★ ★ ★	★ ★ ★	★ ★ ★	★ ★ ★	A	★ ★ ★	
RAINBOW WALKER Synapse Software 5221 Central Ave Richmond, CA 94804 (415) 527-7751 \$34.95 ©1983	Hop along a rainbow, turning it into a beautiful, multihued pattern. Ideal for younger players frustrated by more difficult programs, but dull for proficient players. For ages 8+. —DELSON	Reviewed on Atari 400/800/XL series, 32K (disk or cassette). Versions planned for Apple and Commodore 64. Joystick required.	Defective materials replaced free w/in 90 days; \$5 fee thereafter or if user-damaged.	★ ★ ★	★ ★ ★	★ ★ ★	★ ★ ★	E	★ ★ ★	
REGATTA Howard W. Sams Software 4300 W. 62 St. Indianapolis, IN 46268 (800) 428-7267 \$29.95 ©1983	Small-craft sailing simulation combines realistic yachting techniques with moderately difficult courses. Teaches newcomers the essentials of the sport. For ages 10+. —DELSON	Reviewed on Apple II/II plus/Ile, 48K (disk).	Defective disks replaced free w/in 90 days; \$15 fee thereafter; \$5 fee for backup copy.	★ ★ ★	★ ★ ★	★ ★ ★	★ ★ ★	A	★ ★ ★	
STAR LEAGUE BASEBALL Gamestar Inc. 1302 State St. Santa Barbara, CA 93101 (805) 963-3487 \$31.95 (Atari) \$29.95 (Commodore)©1983	Absorbing sports simulation for ages 8+ lets players pitch, hit, and field balls by taking on the computer or other players in nonstop action. Good for ages 8+. —DELSON	Reviewed on Atari 400/800/XL series, 32K (disk or cassette). Also for Commodore 64 (disk or cassette). Version planned for Apple. Joystick required.	Defective material replaced free w/in 90 days.	★ ★ ★	★ ★ ★	★ ★ ★	★ ★ ★	A	★ ★ ★	
STAR RAIDERS Atari, Inc. 1312 Crossman Road Sunnyvale, CA 94086 (800) 538-8543 \$44.95 ©1980	This classic shoot-'em-up combines strategic elements of defending a series of space stations with arcade skills of blasting away enemies in a Star Wars-like setting. —DELSON	Atari 400/800/XL series, 16K (cartridge). Joystick required.	Defective cartridges replaced free w/in 90 days.	★ ★ ★	★ ★ ★	★ ★ ★	★ ★ ★	A	★ ★ ★	
TELENGARD Avalon Hill Game Co. 4517 Harford Road Baltimore, MD 21214 (301) 254-9200 \$28 (disk) \$23 (cassette) ©1983	Take on elves, dragons, and other foes as you map your way into and out of multileveled dungeon. Role-playing adventure game offers limitless questing for ages 12+. —DELSON	Reviewed on Apple II/II plus/Ile, 48K (disk). Also for Atari 400/800/XL series, 48K (disk or cassette) and Commodore 64 (disk or cassette). Version planned for IBM.	Defective materials replaced free.	★ ★ ★	★ ★ ★	★ ★ ★	★ ★ ★	D	★ ★ ★	
TUTANKHAM Parker Brothers 50 Dunham Road Beverly, MA 01915 (617) 927-7600 Approx. \$35 ©1983	Explore a multileveled tomb, picking up treasure, unlocking secret doors, and fighting off monsters in first-rate adaptation of the arcade game, for ages 10+. —DELSON	Reviewed on Commodore VIC-20, 12K (cartridge). Also for Coleco ADAM (cartridge). Joystick required.	Defective cartridges replaced free w/in 6 months; \$8 fee thereafter.	★ ★ ★	★ ★ ★	★ ★ ★	★ ★ ★	D	★ ★ ★	

RATINGS KEY O Overall performance; D Documentation; EH Error-handling; GQ Graphics quality; EU Ease of use; V Value for money; ★ Poor; ★★ Average; ★★★ Good; ★★★★★ Excellent; N/A Not applicable; E Easy; A Average; D Difficult; † Longer review follows chart

WHAT'S IN STORE SOFTWARE REVIEWS

On the following pages, you'll find in-depth reviews of some of the programs listed in the Software Guide. Refer back to the Guide on page 81 for information such as backup policies and addresses of software manufacturers.

HOME BUSINESS & HOME MANAGEMENT

Speed File

HARDWARE REQUIREMENTS: Apple II/II plus/IIc, 48K (disk). Version planned for IBM.

MANUFACTURER: Bluebush Inc.
PRICE: \$125

Affordable electric-filing systems (also known as data-base management systems) are often slow in retrieving and storing the information they're meant to process quickly. And in general, the easier they are to use, the slower they store and retrieve data.

Speed File meets all and exceeds most of the criteria for a superior filing system. Its tremendous speed hasn't been compromised by its equally impressive ease of use. It's entirely menu-driven (meaning you select the operation you want to perform from a list of options such as SCAN, ADD, EDIT, SAVE), and it's introduced by a clear, brief tutorial.

I first used *Speed File* to set up a schedule file of broadcast and cable movies and shows that I wanted to be sure to watch or record on my VCR for later viewing. Because I hadn't planned out the organization of the files ahead of time, I used *Speed File*'s easy editing commands to restructure them several times before settling on the right format.

Getting your data out of the file is really where *Speed File*'s fast action comes in. If you want to view all records in which a particular date appears, you don't have to specify where on the screen it's located. Merely type the date in and the program scans for it anywhere on the record. This makes the program especially useful for loosely structured information such as notes, diary entries, and abstracts.

Speed File does have some limitations. You can't store records of more than 1,600 characters in length. And you'll have to print out entire records at a time, not just single bits of information like air dates, addresses, or phone numbers. Still,

for a program that combines such speed and ease of use, these are minor considerations indeed.

—DAVID WILSON

Le Script

HARDWARE REQUIREMENTS: TRS-80 Models I/III/4, 48K (disk).

MANUFACTURER: Anitek Software Products

PRICE: \$129.95

If you've got fairly serious word-processing needs; if you want a program to help you with term papers, reports for the office, club newsletters, and the like, *Le Script* should be among the packages you consider. It's a powerful program with a number of features that make it useful in homes where a printer clacks steadily away.

Le Script lets you view your text on-screen as it will appear on the printed page, complete with indents, margins, and page breaks. You can use *Le Script* with dozens of different printers, and the program has a clear and easy-to-master method for signaling the printer to underline or italicize text. To delete, move, or edit text requires as many as five keystrokes in other packages. It only takes two with *Le Script*.

Beware of *Le Script*'s few shortcomings. For one thing, the documentation has some holes, especially where saving files is concerned. Also, the program does not lend itself to printing out charts or tables.

Le Script is powerful. It takes some time to master. But once learned, it's easy to use. Though it's not something you'd want to give to your 7-year-old or use for simple correspondence, *Le Script* is highly recommended for more serious uses. The minister at our local church, a confirmed computer fanatic, swears by it, and uses it to process the congregation newsletter.

—LARRY KRENGEL

MicroFiler

HARDWARE REQUIREMENTS: Atari 400/800/XL series, 16K (cartridge). Disk drive or cassette required for information storage.

MANUFACTURER: Microbits Peripheral Products, Inc.

PRICE: \$49.95

I was looking for a program to help keep track of the records of my model car-racing club. I wanted something that wouldn't be difficult to set up, a program that anyone in the club could use, even if they

weren't familiar with computers. *MicroFiler* fits the bill perfectly.

The first thing you'll have to do is set up the screen layout of your filing system. You do this for every new file you create. Do you want names at the top of the screen, addresses below, notes and comments at the bottom? In just a few minutes I was able to create the format I needed to store the club's records. I got so enthused using this program that I decided to get my wife into the act and created a file with all her favorite recipes in it.

When it comes to locating a specific file, you can search through the complete system one item at a time. Or you can search for special features you indicated when setting up the system. Call up all the desserts, then narrow it down to chocolate desserts to find a chocolate mousse recipe that you've stored. Plus, the whole file can be alphabetized, which makes it handy for mailing lists.

Though it lacks some super-sophisticated features, *MicroFiler* is well-suited to home, hobby, and club-management tasks.

—GLEN MCCARTNEY

EDUCATION FUN LEARNING

The Hinky-Pinky Game

HARDWARE REQUIREMENTS: Apple II/II plus/IIc, 48K (disk).

MANUFACTURER: The 22nd Ave. Wordshop

PRICE: \$30

What two rhyming words might describe an exciting movie about a butterfly's childhood? (Caterpillar thriller.) Or how about two rhyming words that stand for a television set? (Boob tube.)

If you find word games like this, also known as "hinky-pinkies," entertaining and challenging, then *The Hinky-Pinky Game* is worth exploring. Intended for puzzlers of all ages, the package contains 180 ready-made hinky-pinkies of varying levels of difficulty. Once you master the preprogrammed puzzles, you can move on to the disk's flip side where an easy-to-use facility helps you create your own.

"Easy to understand," "Lots of fun to play": These were a few of the favorable comments that came from my kids. They liked the game's un-

WHAT'S IN STORE SOFTWARE REVIEWS

usual friendliness—for example, if you misspell a word, the computer will display a word you may have been trying to type in. If you've got the right word but it's in the wrong place, the computer will move it to the correct location. A series of clues help you along and insure against young or novice players' frustration.

In addition to being entertaining, *The Hinky-Pinky Game* teaches a large number of skills. It provides practice with rhymes, as well as vocabulary and deductive reasoning. It even includes a list of suggested children's books that involve play with language.

—TONY MORRIS

Kidwriter

HARDWARE REQUIREMENTS: Commodore 64 (disk). Also for Apple.

MANUFACTURER: Spinnaker Software Corp.

PRICE: \$34.95



Like leading the proverbial horse to water, you can lead kids to a word-processing program, but it's hard to make them use it. Kids in the 6-10-year-old group will type their name forty-seven times or fill the screen with observations like JOE HAS ROCKS IN HIS HEAD. After that, they'll be stumped for words. But not with *Kidwriter*.

A sort of "storybook processor," *Kidwriter* allows children to create a picture on the top half of the screen and then write a story about it on the bottom half. Ninety-nine different shapes ranging from boys and girls to spaceships, fences, and ponds can be placed against a variety of backgrounds—day and nighttime landscapes, a theater stage, or even an empty room. Kids can adjust shape-size and placement, and color and title their works with oversize letters and numbers, too.

After the "illustration" for a page is complete, the budding author presses "D" for done and is ready to write a story with the simple word

processor. Kids can save several text and picture pages, linking them together to form a story with almost as many pages as a child can dream up. (We wished there was an option to let us print out our stories on our dot-matrix printer.)

Each time my 6-year-old, Molly, uses *Kidwriter*, she loads "Peter Duck," the first "story" we wrote together.

With *Kidwriter* at our house, my three youngest kids are as likely to ask me to write a bedtime story as to ask me to read them one!

—BETSY BYRNE

Microzine, Vol. 1, No. 3

HARDWARE REQUIREMENTS: Apple II w/ Applesoft/II plus/IIe/IIc, 48K (disk).

MANUFACTURER: Scholastic Wizware

PRICE: \$39.95

The third issue of *Microzine*, an innovative magazine on disk, is as much a fun-learning breath of fresh air as its two predecessors. It doesn't simply teach skills; it generates excitement and enthusiasm about learning and exploration.

The most complex of the package's four programs, and the one with the most obvious "educational" value—"Amazing Robot"—requires you to direct a robot through a series of mazes using simple instructions. Move the robot with commands, such as FD10 (forward 10 units). Or create a "program" with sequences of commands, such as FD10, RT45 (turn right at a 45-degree angle), and BK5 (back 5 units). Give sequences special codes and call them up as special subprograms later. This activity is similar to using the Logo language, widely utilized in schools to build awareness of sequences, order, and cause-and-effect relationships.

But that's not all. Three other programs are included besides "Amazing Robot." You have to get to the bottom of the mysterious disappearance of a valuable statue by questioning suspects and gathering clues in "Mystery at Pinecrest Manor." Solving the crime is fun and requires careful attention to detail, as well as logical thinking.

"Tag" is an action/arcade game in which you try to tag little characters while avoiding an electric net that spins across the screen. Finally, "Bookstore" allows you to browse through a junior data base of about 200 children's books.

A clear, friendly, and informative

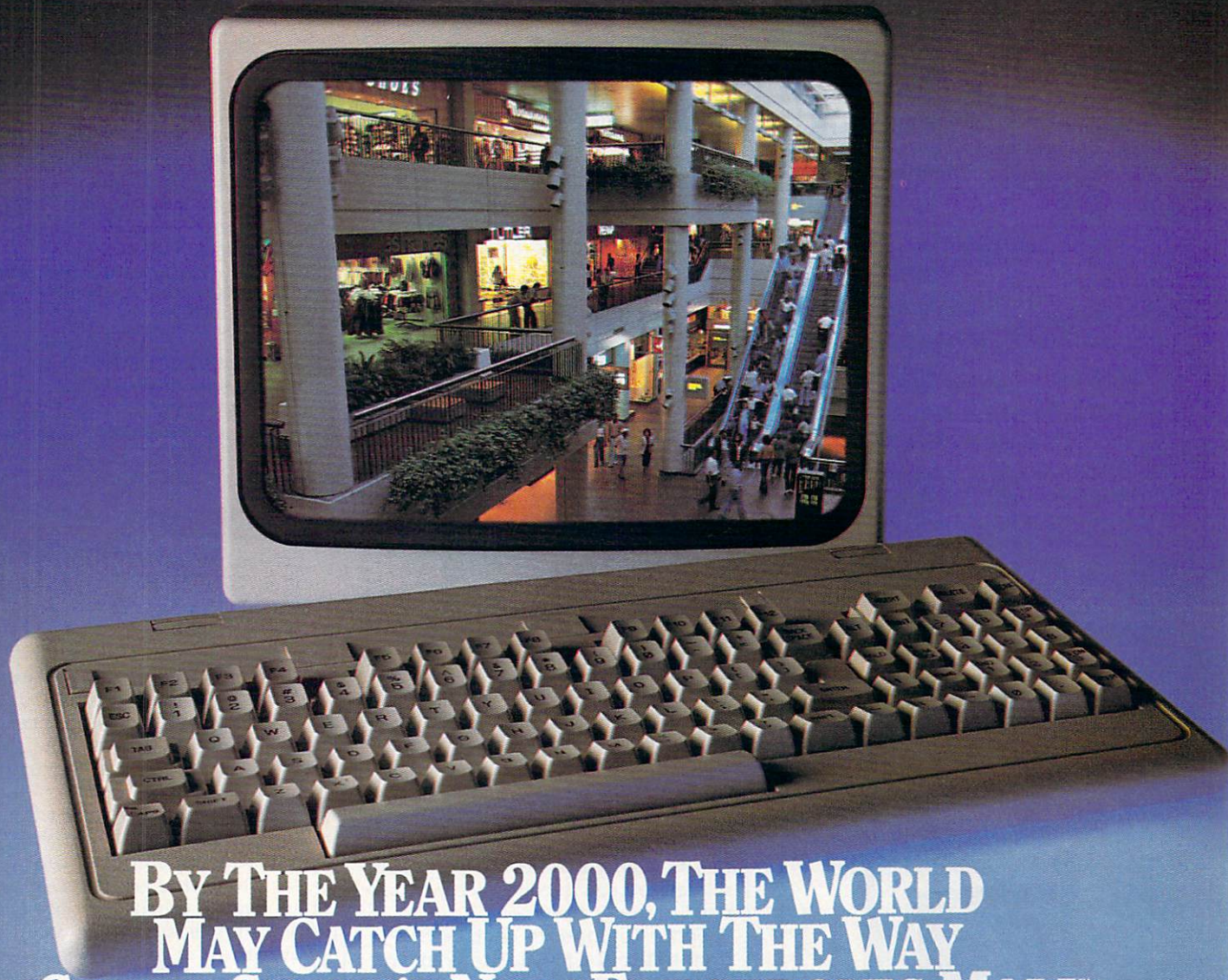
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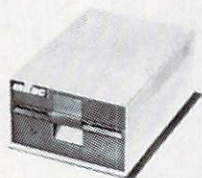


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48-page manual, a summary card of the robot commands, and top-rate graphics are among the many features that add to this program's high quality.

—TONY MORRIS

Turtle Toyland Jr.

HARDWARE REQUIREMENTS: Commodore 64 (disk). Versions planned for Apple and IBM.

MANUFACTURER: HesWare

PRICE: \$34.95



Even though its box blurb indicates that it is "a pre-Logo, joystick-operated introduction to programming," *Turtle Toyland Jr.* has its own set of merits whether or not the program's related to Logo (a computer language used in many classrooms).

Turtle Toyland Jr. enables children to use the joystick to point to pictures (or icons) which represent various operations. They can draw pictures, create small graphic images (known as sprites) and animate them, and compose musical melodies. Best, and most powerful of all, they can put all these pieces together to create their very own animated cartoon show, all via the joystick.

Our *Toyland* exploration party consisted of Molly (just turned 6), Tim and James (twins, 8), and Mom—who is NOT a programmer. Our first stop was the **PLAYGROUND**, where we spent some time getting to know the drawing turtle. Then we moved on to the **CROSSROADS** (the main section from which you move to any other operation) and into **TURTLE TRAINING LAND**, where we drew a picture of a sailboat on a peaceful blue lake. For some action we sprinted off to **SPRITE LAND**, where we took advantage of the Commodore 64's unique graphic capabilities to make a tiny image—a sea gull—and animate it (in **SPRITE TRAINING GROUND**). After creating a suitably nautical five-note ditty in **MUSIC LAND**, we put all the pieces together.

Turtle Toyland Jr. could best be

described as a family computing activity. Most younger kids will need adult help to learn all the complicated commands—especially in the **FILM-STRIP** routine. Still, once they get the hang of it, they'll want to spend hours with the turtle in his world.

—BETSY BYRNE

Weather Command

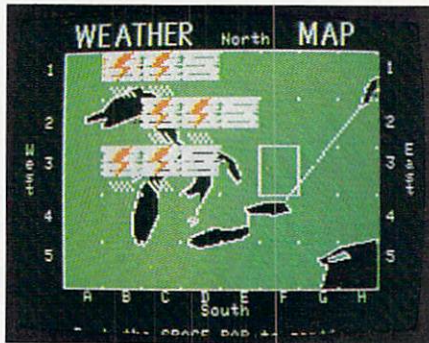
HARDWARE REQUIREMENTS: Apple II/II plus/IIe, 48K (disk).

MANUFACTURER: Educational Audio Visual Inc.

PRICE: \$40

The first Inter-Galactic Treaty Conference is about to convene. Ambassador Parhelion will arrive in Wellington, New Zealand, on Monday morning. The ambassador requires steady sunlight while on earth, but the weather report indicates that Wellington will have rainy, warm weather until Monday afternoon. It is Saturday now; unless you can turn around the forecast, the ambassador will be unable to participate in the conference.

As an Apprentice Weather Coordinator in Wellington, you have various weather machines at your disposal. Some change air pressure, some change the amount of moisture in the air, and some change air temperature. If you can place the machines in the right places, the weather will begin to change as it approaches Wellington, and with luck, Monday morning will dawn with a brilliant sunrise and clear blue skies. Sunny skies and you'll be promoted to a higher office, where you'll take on tougher tasks. Clouds or rain and you'll have to start over and try again.



Weather Command is an excellent example of what "fun learning" is all about. It teaches sophisticated weather principles in an exciting way. Excellent graphic displays depict several kinds of weather maps, cloud formations (some animated), and even pictures of each ambassa-

dor's home planet!

Weather Command is probably most appropriate for children over 12 years old. The documentation isn't as thorough as it might have been, so the package is likely to appeal most to those who already know a bit about weather. One of the standard children's books on weather may make it a bit easier and entertaining for young, novice meteorologists.

—TONY MORRIS

GAMES

Aztec

HARDWARE REQUIREMENTS: Apple II/II plus/IIe, 48K (disk). Also for Commodore 64. Version planned for Atari.

MANUFACTURER: Datamost Inc.

PRICE: \$39.95



So you couldn't make it to see *Indiana Jones and the Temple of Doom*, and the video store's fresh out of *Raiders of the Lost Ark*? You might want to look into *Aztec*, an action/animation adventure game with the most exciting, true-to-life treasure hunting this side of the silver screen.

Though difficult to learn, *Aztec's* play system has one of the most complete control panels for human movement and action I've seen. Your character can walk, run, jump, kneel, crawl, stop, turn right or left, climb, place and light dynamite, open and look into boxes, take their contents, and fight with a pistol or machete (by lunging, slashing, moving right and left, or spinning around in place). It may take a while to master the commands, each triggered by a single key press, but getting there's fun as you pick up ways to map your path through a vast underground labyrinth in search of a golden idol.

In addition to the terrific command system, *Aztec* boasts eight lev-

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WHAT'S IN STORE SOFTWARE REVIEWS

els of play, a random system of floor and room arrangements that present an almost endless variety of maze configurations, and a wide assortment of monsters to confront the adventurer.

Playtesters ages 10 and up found Aztec one of the best games of the year, especially relishing its command system and the ability of the hero to overcome most difficulties when properly and carefully controlled. Players learned to plant dynamite and seek shelter before it exploded, and to avoid traps such as the infamous closing walls.

—JAMES DELSON

Murder on the Zinderneuf

HARDWARE REQUIREMENTS: Atari 400/800/XL series, 48K (disk). Also for Commodore 64. Versions planned for Apple and IBM. Joystick required.

MANUFACTURER: Electronic Arts

PRICE: \$40

If you're a mystery, text- or text/graphic-adventure devotee, or just interested in about a half hour's dedicated brain teasing, this game is



for you. There are no spaceships to blow up or hairpin turns to navigate. But your mental skills will be tested to the limit as you attempt to solve a mystery aboard a dirigible, 5,000 feet above the Atlantic, in the year 1936.

You play this game solo against a set of computer suspects, taking on the "role" of one of seven great detectives whose traits have been fed into the computer. The stable of sleuths includes such notables as "Agatha Marbles," "Lieutenant Cincinnati," and "Jethro Knight," among others.

Wander through the airship Zinderneuf (shown by a nice on-screen

scrolling display), searching for clues, uncovering them in out-of-the-way places, and interrogating passengers to obtain information about the case. You gradually build up your evidence until you think you have solved the problem. During the course of the game you can accuse several different people. But watch out! People whom you incorrectly "finger" won't speak to you again on that trip.

If you solve the case correctly, the computer awards you with a detective rating based on your speed, the amount of evidence you've found, and the number (if any) of false accusations you made before cracking the case. The game lasts only 36 minutes (12 game hours), so you've got to make the most of your time while leaving as few stones unturned as possible.

Playtesters found it to be completely involving; their sleuthing know-how improved with every new game. Team play is especially fun. Group efforts help to unravel clues faster, and more eyes looking at the map can spot suspects before they

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get too far away. This suspenseful sleuth adventure's suitable for ages 8 and up with parental guidance, 12 and up without it. —JAMES DELSON

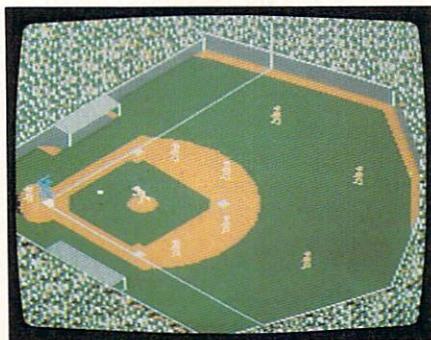
Star League Baseball

HARDWARE REQUIREMENTS: Atari 400/800/XL series, 32K (disk or cassette). Also for Commodore 64. Joystick required. Version planned for Apple.

MANUFACTURER: Gamestar

PRICE: \$31.95 (Atari); \$29.95 (C 64)

Pitchers, batters, and baseball fans of all ages will find this delightful and highly playable arcade/strategy game a lasting entertainment value. Solitaire and two-player versions allow for numerous options. Put together a team from a variety of pitchers and different types of batters (steady hitters versus sluggers). In the field, the joystick control allows the pitcher to throw sizzling fastballs, slow sliders, screwballs, knuckle balls, and more. After the ball's hit, the control switches over to the fielders who catch fly balls and field grounders, and throw to



specified bases.

At bat, you can bunt, hit away, even try to sacrifice. Practice in the pregame warmup helps a great deal. Once on base, the excitement starts. Good players can steal successive bases and, with luck, even go for home (an infrequent occurrence in the real thing, I'm told). Unlike other baseball programs, the nonstop action here makes for exciting play throughout the game.

Baseball fans and nonsportspeople alike found *Star League Baseball* an absorbing and thoroughly entertaining game. Multiplayer games were popular, with three-person

teams taking turns batting and pitching. We even improvised a World Series, which went on for some five hours of exciting play.

This program is exceptionally good for ages 8 and up, though those with good reflexes tended to do better at bat, and those with an eye for strategy were more proficient on the pitcher's mound. —JAMES DELSON

Operation Whirlwind

HARDWARE REQUIREMENTS: Atari 400/800/XL series, 48K (disk). Joystick required. Version planned for Commodore 64.

MANUFACTURER: Broderbund Software
PRICE: \$39.95

Here's one of the easiest to grasp war games to date. It features a straightforward, coherent rule book, simple play system with four levels of difficulty (beginner to expert), and realistic, you-are-there play action. You command a battalion of infantry, tanks (light and heavy), reconnaissance vehicles, artillery, engineers, and a headquarters unit. Split into two columns, your units

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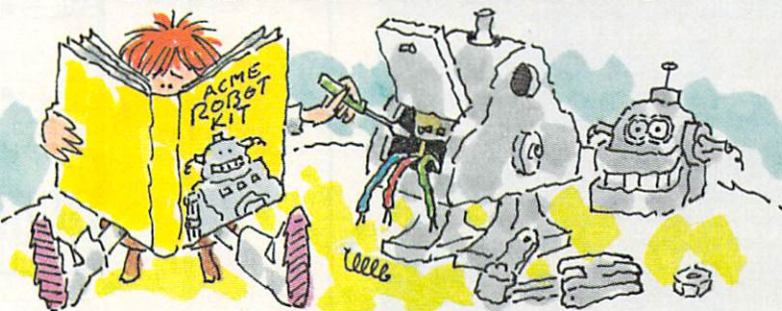
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must fight across a scrolling landscape, take a defended town, occupy it, and (in the three more difficult scenarios) defend your gains against a series of counterattacks.

What makes this game unique in the field of other battle simulations is its active and colorful play system. More sophisticated war games may be appealing to experienced players, but they're overwhelming to beginners. Broderbund has simplified many of the more complex elements.

Several novel ideas have been worked into this simulation: Your army can build bridges—allowing you to cross rivers with ease instead of having to ford them. Also, the joystick-controlled play system makes for a much faster moving game.

As an instructional tool, this simulation is an excellent introduction to armored warfare in the second half of this century. Several playtesters complained that they were repeatedly wiped out by the computer, no matter what they did. Then they observed that you don't win battles by charging everything you have into the mouths of enemy guns. That

was tried in World War I, and failed, leading to the innovation of the tank.

—JAMES DELSON

Telengard

HARDWARE REQUIREMENTS: Apple II/II plus/IIe, 48K (disk). Also for Atari and Commodore 64. Version planned for IBM.

MANUFACTURER: Avalon Hill

PRICE: \$28 (disk); \$23 (cassette)

Role-playing adventure games, in which you play a single voyager or a party of adventurers taking on untold dangers in pursuit of mysterious powers and unfathomable riches, continue to proliferate. Avalon Hill's *Telengard* is one of the most challenging games to come along in the past year. Though it is strictly a one-player game, it has incorporated some of the most advanced elements of the genre into an exciting, challenging, and exhausting scenario.

It has a lot of the features found in other role-playing games, but *Telengard's* strengths lie in several unique aspects of the program. First, it is the only game on the mar-

ket in which your search for treasure takes place on a virtually limitless playing field. According to the folks at Avalon Hill, no one has successfully mapped their way to the edge of any floor in the 50-level dungeon! This means that players can roam the halls and rooms of the labyrinth forever without ever duplicating their steps, a feature that has helped establish this as a game with long-lasting value in a crowded market. Second, characters whose names begin with the letters "SV" can be saved on disk when they enter one of the many inns accessible from the highest level of the maze (the instructions for this maneuver are poorly explained in the manual). This means that you can explore to your heart's content. If you die in battle, or at the hands of a minotaur or mummy, or lose experience levels, you won't have to start all over again.

Even without the multiplayer features, colorful graphics, and arcade action of other adventure games, *Telengard* offers players, ages 12 and up, the opportunity for limitless questing.

—JAMES DELSON

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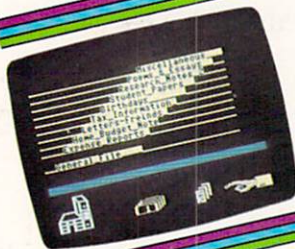
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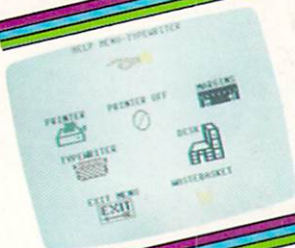
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